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# CHINESE AMPHIBIANS AND REPTILES IN THE UNITED STATES NATIONAL MUSEUM

BY

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The United States National Museum has of late years received a large number of amphibians and reptiles from China, and as there are indications of an increasing interest in these vertebrates among students and collectors in that country, it has been thought best to give as full an account as practicable of the material available, in order to acquaint them not only with what the National Museum possesses, but inferentially with what is still needed before a complete herpetology of China proper can be attempted. In my Herpetology of Japan and Adjacent Territory<sup>1</sup> I included not only the Russian Coast Province of Siberia, but also Korea, eastern Manchuria, and adjoining parts of northeastern China proper. Each genus and species, the Chinese ones included, were treated in detail, with full synonymy and bibliographic references, etc. In a subsequent paper, The Batrachians and Reptiles of Formosa,<sup>2</sup> genera and species added to the fauna since 1907 were similarly elaborated in full. It has been considered unnecessary to repeat these synonymies and references in the present paper, hence only genera and species not found in the two earlier works are here treated in the same manner. However, reference has been given under each species to the page in the Herpetology of Japan and the paper relating to Formosa, where the species with synonymy, description, and frequently also illustration may be found. In addition, references omitted in the earlier work are given in so far as they relate to China proper, but no attempt has been made to include those referring to Hainan and Formosa.

The paper by R. Mell, Beitraege zur Fauna sinica (Arch. Naturg., vol. 88, sect. A, 1922) was received too late to be incorporated in the synonymies.

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<sup>1</sup> Bull. U. S. Nat. Mus. No. 58, 1907.

<sup>2</sup> Proc. U. S. Nat. Mus., vol. 38, May 3, 1910, pp. 91-114.

The National Museum is particularly anxious to receive additional material of the critical species discussed in detail in the following pages, as well as species not yet represented in our collection.

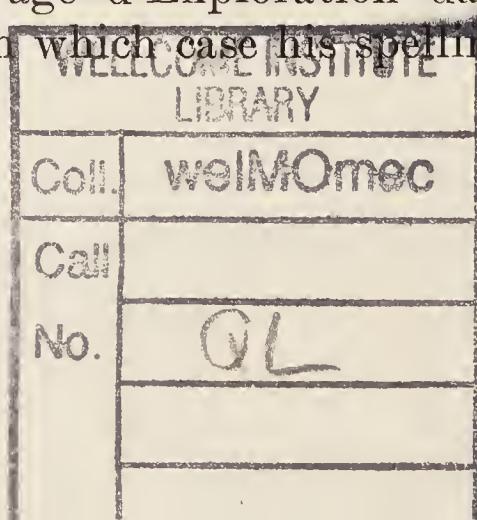
The orthography of the Chinese locality names and their identification in the various publications of French, German, English, and Russian writers, who have each used a transliteration into his own particular language, has caused great trouble. The confusion has been increased by some Russian herpetologists who have retransliterated from the Russian alphabet to the German or the Polish. However, the necessity of a uniform spelling of these names in the following paper is obvious. On the other hand, it is equally obvious that some authority had to be followed, which has been generally adopted and whose names are incorporated in detailed maps where they may be easily located. As such an authority I have selected the Atlas of the Chinese Empire, specially prepared by Edward Stanford for the China Inland Mission, 1908. This Atlas consists of separate maps of the 18 provinces of China proper on the scale of 1:3,000,000, and 4 of the great dependencies Sinkiang, Manchuria, Tibet, and Mongolia, on the scale of 1:7,500,000, together with an index to all the names on the maps.

With regard to the system of orthography followed in this Atlas, the Editorial Secretary of the Mission writes in the preface:

After carefully considering the relative values of the various systems in use, it was felt that the orthography adopted by the Chinese Imperial Post Office must ultimately carry the day, since conformity to that spelling would be necessary in all postal and telegraphic communications with China, a usage which could hardly fail to be a determining factor of no small importance.

It is probable that the romanisation adopted will not satisfy all sinologues, but academic considerations have frequently to yield to a practical *modus operandi*.

Whenever practicable, except in quotations, I have therefore adopted the spelling of this Atlas. In some cases alternate spellings have been given. In cases where I have been unable to find a locality on any of the maps accessible to me I have had to fall back on the spelling of the specimen label or the publication referring to that particular locality. I regret very much that in many instances it has been impossible to locate names given by Abbé Armand David, the French missionary, on the Atlas to which I have referred. Some of them could be located on the maps accompanying his *Journal de mon Troisième Voyage d'Exploration dans l'Empire Chinois* (2 vols., Paris, 1875), in which case his spelling of the names has been accepted.



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# Class AMPHIBIA

## Order CAUDATA

### Family CRYPTOBRANCHIDAE

#### **MEGALOBatrachus JAPONICUS Temminck**

Synonymy, Herpetology of Japan, 1907, p. 6, to which add:

*Megalobatrachus maximus* BOULENGER, Cat. Batr. Grad. Brit. Mus., 1882, p. 80 (Japan, China).—BOETTGER, Offenbach. Ver. Naturk., 24–25 Ber., 1885, p. 166 (Mupin).—GUENTHER, in Pratt's To Snows of Tibet, 1892, p. 243 (Kia-ting-fu, Szechwan, 1,070 feet altitude).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 371.—WOLTERSTORFF, Abh. Mus. Magdeburg, vol. 1, 1906, p. 132 (Canton, probably from interior).—VOGT, Sitz. Ber. Ges. Naturf. Freunde, Berlin, 1914, p. 102 (northern Kwangsi).—DUNN, Bull. Mus. Comp. Zoöl., vol. 62, 1918, p. 134 (Japan; Szechwan).

*Cryptobranchus maximus* STANLEY, Journ. N. China Asiat. Soc., vol. 46, 1915, p. xiv (Yachow, Szechwan).

*Megalobatrachus japonicus* BARBOUR, Mem. Mus. Comp. Zoöl., vol. 40, no. 4, 1912, p. 125 (Yachow and Hung-ya-hsien, Szechwan).

*Megalobatrachus* species DESPAX, Bull. Soc. Zool. France, vol. 38, 1913, p. 134 (Prov. Kweichow; Shensi); Bull. Mus. Hist. Nat., Paris, vol. 19, 1913, p. 183 (Kweichow).

While the material at hand can not be considered as conclusive, consisting as it does of only two Chinese specimens, one adult and one young, and eight Japanese specimens, adult and young, nevertheless I have come to the conclusion that Boulenger and Barbour may be correct in considering *Sieboldia davidi*<sup>3</sup> as a synonym of *M. japonicus*. It should be noted, however, that in our large Chinese specimen the tubercles on top of the head are smaller and leave a wider smooth space between the eyes. The tubercles also have a tendency to go in pairs. In all our five large Japanese specimens the top of the head is much rougher with much larger and more numerous tubercles. The Chinese example also has slightly larger fingers and toes, and the nostrils appear to be a trifle farther apart.

Both of our Chinese specimens are from Yachow, Szechwan. The adult one (No. 52409) we owe to the kindness of E. F. Shields, and the young (No. 65454) to L. A. Lovegren.

### Family SALAMANDRIDAE

#### **TRITURUS<sup>4</sup> ORIENTALIS (David)**

1875. *Triton orientalis* DAVID, Journ. Trois. Voy. Chinois, vol. 1, p. 32 (type-locality, Tche-san [near Chüchow fu], Chekiang Prov., China; types in Paris Mus.; A. David, collector); vol. 2, 1875, p. 215 (Tsitou, southern Kiangsi); pp. 233, 238 (Mi-Ouan, Kiangsi).

<sup>3</sup> See Herp. Japan, p. 7.

<sup>4</sup> I have accepted, at least provisionally, Doctor Dunn's dictum (Bull. Mus. Comp. Zoöl., vol. 62, no. 9, 1918, p. 448) with regard to the nomenclature of these salamanders in place of *Diemictylus* employed in Herp. Japan, 1907, p. 15.

1882. *Molge pyrrhogaster* BOULENGER, Cat. Batr. Grad. Brit. Mus., p. 19  
 (part: Kiukiang Mts., China) (not of Boie).—BOETTGER, Offenbach. Ver. Naturk., 24–25 Ber., 1885, p. 165.—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 371.

1906. *Triton pyrrhogaster* subsp. *orientalis* WOLTERSTORFF, Zool. Anz., vol. 30, 28, Aug. 1906, p. 558 (Wusüch, and 25 miles inland from Cheechow [Kichow?], Hupeh); Abh. Mus. Magdeburg, vol. 1, 1906, pp. 132, 153, pl. 1, figs. 3–6.

A single specimen (No. 65523) of this interesting species has been sent to the Museum by Prof. C. Ping, from the neighborhood of Nanking. It agrees in almost every respect with the detailed descriptions by Doctor Wolterstorff, especially with his No. 5. The black collar, already mentioned by Père David, is present and there is no red spot at the angle of the mouth.

#### Genus PACHYTRITON Boulenger

1878. *Pachytriton* BOULENGER, Bull. Soc. Zool. France, vol. 3, 1878, p. 72  
 (monotype, *Triton brevipes* SAUVAGE).

#### PACHYTRITON BREVIPES (Sauvage)

1875. *Cynops chinensis* DAVID, Journ. Trois. Voy. Chinois, vol. 2, pp. 231, 239 (Tsitou, southern Kiangsi) (not of Gray 1859).

1877. *Triton brevipes* SAUVAGE, Bull. Soc. Philom. Paris (7), vol. 1, 1877, p. 117 (type-locality, southern Kiangsi, China; types in Paris Mus.; A. David, collector).—*Pachytriton brevipes* BOULENGER, Bull. Soc. Zool. France, vol. 3, 1878, p. 72; Cat. Batr. Grad. Brit. Mus., 1882, p. 30, pl. 1 (South Kiangsi).—BOETTGER, Offenbach. Ver. Naturk., 24–25, Ber., 1885, p. 165; 26–28 Ber., 1888 (p. 168).—WERNER, Abr. Bayer. Akad. Wiss., II Kl., vol. 22, no. 2, 1903, p. 371.

Of this rare species which apparently has not been collected since Père David sent the type material to the Paris Museum in 1873, the National Museum has received two splendid specimens (Nos. 65341–2) from Mr. Sowerby. Père David who believed that he had *Cynops chinensis*, which Swinhoe had shown him in Shanghai, because they were larger than his *Triton orientalis* and had the underside yellow with black spots, collected his specimens not far from Tsitou in the mountains of southern Kiangsi near the border of Fukien. Mr. Sowerby's specimens are from Yen-ping-fu, Fukien, thus extending the range of the species considerably. They agree perfectly with Boulenger's excellent illustration of one of the cotypes.

#### Family HYNOBIIDAE

##### SALAMANDRELLA KEYSERLINGII Dybowski

Herp. Japan, 1907, p. 37. To synonymy add:

NIKOLSKI, Fauna Rossij, Amphib., 1918, p. 236 (Ural to Kamchatka; northern Mongolia).

*Hynobius keyserlingii* DUNN, Proc. Amer. Acad. Arts Sci., vol. 58, June, 1923, p. 461 (Siberia; Kamchatka; Manchuria).

As the female specimen (No. 53366) collected by Mr. Sowerby at I-mien-po, northern Kirin, Manchuria, has already been mentioned by Dunn, as quoted above, I need make no further remarks here.

### Genus BATRACHUPERUS Boulenger

1878. *Batrachuperus* BOULENGER, Bull. Soc. Zool. France, vol. 3, 1878, p. 71 (monotype, *Salamandrella sinensis* Sauvage).  
 1882. *Batrachyperus* BOULENGER, Cat. Batr. Grad. Brit. Mus., p. 37 (emendation).  
 1912. *Batrachypterus* BARBOUR, Mem. Mus. Comp. Zoöl., vol. 40, no. 4, p. 126 (err. typogr.).

#### BATRACHUPERUS PINCHONII (David)

1871. *Dermodactylus pinchonii* DAVID, Nouv. Arch. Mus. Hist. Nat. Paris, vol. 7, Bull. p. 95 (type-locality, Moupin).  
*Dermodactylus pinchonii* DAVID, Journ. Trois. Voy. Chinois, vol. 2, 1875, p. 216.  
 1877. *Salamandrella sinensis* SAUVAGE, Bull. Soc. Philom. Paris (7), vol. 1, p. 117 (type-locality, Moupin, Szechwan, China; types in Paris Mus., A. David, collector).  
*Batrachuperus sinensis* BOULENGER, Bull. Soc. Zool. France, vol. 3, 1878, p. 72.—DUNN, Proc. Amer. Acad. Arts Sci., vol. 58, 1923, p. 520 (Szechwan).  
*Batrachyperus sinensis* BOULENGER, Cat. Batr. Grad. Brit. Mus., 1882, p. 37 (Moupin).—BOETTGER, Offenbach. Ver. Naturk., 24–25 Ber., 1885, p. 166 (Mupin).—GUENTHER, Ann. Mus. Zool. St. Petersbourg, vol. 1, 1896, p. 209 (Sung-pan and Kuo-chu-chin, Szechwan).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 371.—DUNN, Bull. Mus. Comp. Zoöl., vol. 62, 1918, p. 456 (Liang-hoko Szechwan).  
*Batrachypterus sinensis* BARBOUR, Mem. Mus. Comp. Zoöl., vol. 40, no. 4, 1912, p. 126, pl. 1, fig. 1, (Lianghokow, W. Szechwan, alt. 12,000 feet).  
 1898. *Salamandrella keyserlingii* BEDRIAGA, Wiss. Res. Przewalski Central-Asien Reis., Zool., vol. 3, pt. 1, May 15, 1898, p. 3 (part: Rivers Kserntso and Lumbu, Szechwan).

Doctor Dunn has treated so exhaustively of this species and described our specimens so fully that I need only record here the gratifying fact that Rev. D. C. Graham has sent the National Museum four fine specimens (Nos. 64419–22) which he collected on Mount Omei, Szechwan. The following interesting note accompanied the specimens: "The salamanders were caught in the White Dragon Pool on summit of Mount Omei, 11,000 feet above sea level, on August 20, 1921. They are called white dragons by the Buddists and the imaginary White Dragon king is worshiped in a small temple near the pool. The Chinese say that if one captures and kills one of these salamanders a storm will follow."

Since the above was written he has forwarded a young specimen (No. 67835) collected at the Yellow Dragon Gorge, near Sungpan.

No. 10995 was received from the Paris Museum as one of the types of this species, but the locality Kiangsi is attributed to it. This is

probably due to a confusion with David's types of *Pachytriton brevipes* which came from that province. His types of *B. sinensis*, however, were taken in Moupin, and there can be but little doubt that the latter is also the locality of our specimen.

## Order SALIENTIA

### Family DISCOGLOSSIDAE

#### **BOMBINA ORIENTALIS (Boulenger)**

*Herp. Japan*, 1907, p. 51, pl. 7. Add to synonymy:

*Combinator orientalis* WOLTERSTORFF, Abh. Mus. Magdeburg, vol. 1, 1906, p. 132 (Tsingtau; Masampo, Korea).

*Bombina orientalis* NIKOLSKI, Fauna Rossij, Amph., 1918, p. 177 (Primorsk. Government; Iliampo, Railway Sta., East. Chinese R. R., Manchuria, etc.).

Eight splendid specimens (Nos. 52345-52) were collected by Sowerby in Southern Manchuria, at the Yalu River, about 180 miles from its mouth. Recently, Prof. C. Ping has sent three specimens (Nos. 66849-51) from Chefu.

### Family BUFONIDAE

#### **BUFO BUFO ASIATICUS (Steindachner)**

For synonymy and illustrations see *Herp. Japan*, 1907, pp. 66-67, figs. 49-52. Add to synonymy:

*Bufo vulgaris* WOLTERSTORFF, Abh. Mus. Magdeburg, vol. 1906, p. 131 (Pingshiang; Hankow; Chinkiang; Kiukiang; Shanghai; Tsingtau).—SOWERBY, in Clark and Sowerby, Through Shen-Kan, 1912, p. 112 (Shansi).

*Bufo bufo asiaticus* NIKOLSKI, Fauna Rossij, Amph., 1918, p. 126 (Ussuri; Vladivostok; etc.).

The accumulation of toads since the issue of the Herpetology of Japan, among which the splendid series from the type-locality of *B. asiaticus*, throws considerable light on the variation of the eastern forms of *B. bufo*, without affording conclusive evidence as to the distinctness of the groups recognized by name at the present time. On the other hand, there is not enough difference shown to justify their treatment binomially. There is therefore no warrant for disturbing the nomenclature of the Herpetology of Japan and the Fauna of Russia as yet.

The character relied upon to distinguish *B. asiaticus* from *B. japonicus*, viz., the uniform pale or slightly dark-spotted underside does not hold at all. As a matter of fact, in the 20 grown and half-grown specimens from Shanghai nearly all have the underside strongly marked with black undulating and anastomosing blotches, and only one, the smallest (No. 66347, total length 41 mm.) is un-

spotted, while all the very young ones, 25 mm. and under, are likewise unspotted.

The chief color difference, therefore, seems to be the blackish lateral band in continuation of the lower blackish edge of the parotoid, which appears to be fairly constant in the adults of the eastern form. The alleged larger size and greater distinctness of the tympanum is not particularly noticeable in the series before me. On the other hand, the length of the first toe as compared with the adjoining metatarsal tubercle is relatively greater in the Chinese specimens than in the European ones examined by me.

A series of seven specimens collected by Graham at Tatsienlu, between 8,500 and 12,000 feet altitude, is particularly interesting. They are rather dark in color with the whole underside, except throat, darkly marbled and spotted. The tympanum is rather small, but the first toe is characteristically long. A close comparison with specimens of corresponding sex and age from Shanghai has not revealed any differences.

The specimens of this form now in the Museum in addition to those listed in the Herpetology of Japan are as follows:

- 46617. Shanghai, collected by D. C. Jansen.
- 49642–3. Vicinity of Tai-yuan-fu, Shansi. A. de C. Sowerby.
- 52353, 52355–6. Southern Manchuria, Yalu River, about 180 miles from its mouth. A. de C. Sowerby.
- 52566–8. Kiangyin, Kiangsu Prov. L. I. Moffett.
- 53369. Manchuria, Hei-Hong-Chiang, Sungari River near its junction with the Amur. A. de C. Sowerby.
- 60879–80. Chili, Hsin-Lung-Shan, near Imperial Hunting Grounds. A. de C. Sowerby.
- 65216–24. Shanghai. A. de C. Sowerby.
- 65339–40. Shanghai. A. de C. Sowerby.
- 66340–47. Shanghai. A. de C. Sowerby.
- 66461–2. Hangchow, Chekiang. A. de C. Sowerby.
- 66542–6. Tatsienlu, Szechwan (8,500–12,000 feet alt.). D. C. Graham.
- 66646–7. Tatsienlu, Szechwan (11,500 feet alt.). D. C. Graham.
- 66790–1. Suifu, Szechwan. D. C. Graham.
- 66852. Nanking. C. Ping.
- 66853. Wenchow. C. Ping.

#### BUFO BANKORENSIS Barbour

- 1908. *Bufo bankorensis* BARBOUR, Bull. Mus. Comp. Zoöl., vol. 51, no. 12, April, 1908, p. 323 (type-locality, Bankoro, Central Formosa; cotypes, No. 2432 Mus. Comp. Zoöl., Owston collection); Proc. New England Zoöl. Club, 4, November, 1909, p. 55, pl. 6.—STEJNEGER, Proc. U. S. Nat. Mus., vol. 38, May 3, 1910, p. 94.

Like the many Formosan species, related to Himalayan forms, which have turned up in China, the presence of this toad or a closely allied form might have been predicted. Nevertheless, it is very

gratifying to find in the collections from Mr. Graham two full-grown females, No. 63412, from Suifu, and No. 65922 from Shen-Kai-Si, Szechwan, at an elevation of 9,400 feet. These I have been able to compare with an extensive series of typical Formosan specimens, and have been unable to discover any tangible differences which would justify even a subspecific designation. Nor am I able to detect any particular deviation in the direction of *Bufo himalayanus* which might have been expected in view of the relationship and closer geographic proximity to the latter.

*Bufo bankorensis* is easily recognized by the broad, flat, and smooth surface of the top of the head. The resemblance to *B. melanostictus* is merely superficial.

#### BUFO RADDEI Strauch

For synonymy and illustration see Herp. Japan, 1907, pp. 70-71, figs. 53-57.  
Add to synonymy:

*Bufo raddei* ELPATJEWSKY and SABANEJEW, Zool. Jahrb. Syst., vol. 24, pt. 4, Dec. 1906, p. 262 (Kiakhta, etc.).—SOWERBY, in Clark and Sowerby; Through Shen-Kan, 1912, p. 112 (Shensi, Kansu).—NIKOLSKI, Fauna Rossij, Amph., 1918, p. 93 (Peking, Che-fu, Ordos, Alashan, Ussuri, Koko-nor, etc.).

1898. *Bufo raddei*, var. *przewalskii* BEDRIAGA, Wiss. Res. Przewalski Central-Asien Reis., Zool., vol. 3, sect. 1, pt. 1, p. 48, pl. 1, fig. 6 (type locality Koko-nor; type, Petrograd Mus. no. 2010; Przhevalski, collector).

1898. *Bufo raddei*, var. *pleskei* BEDRIAGA, Wiss. Res. Przewalski Central-Asien Reis., Zool., vol. 3, sect. 1, pt. 1, p. 48 (type-locality, Tola River near Urga, Mongolia; type, Petrograd Mus. No. 1261; Pewtzow, collector).

1910. ?*Bufo nouettei* MOQUARD, Bull. Mus. Nat. Hist., Paris, 1910, p. 152 (type-locality, Sachow and Suchow, Kansu; Kashgar, Sinkiang; types in Paris Mus.; Dr. Louis Vaillant, collector).

The three forms recognized nomenclaturally by Bedriaga were not claimed by him to represent subspecies in the usual sense. Elpatjewsky and Sabenejew confirm this, but express the suspicion that these color phases may be due to differences of sex or age.

Twenty-six specimens received from Sowerby, partly collected by himself in Shensi and Kansu and by A. L. Hall at Hei Sui, northern Chili, close to the Mongolian border, throw considerable light on these questions. The Kansu specimens (Nos. 39368-73, six adult males) were collected at Chen-Kow-Yi, 52 miles east of Lanchowfu at 6,700 feet altitude, on July 18, 1909; those from Shensi as follows: No. 39378, a young specimen, at Hai-shan-ssu, at 3,600 feet altitude, on August 26; Nos. 39374-6, three young ones, 30 miles east of Yenanfu, 3,100 feet altitude, August 26; and No. 39377, adult female, at Yellow River, 40 miles east of Shui-teh-chow, 2,300 feet above the sea. Unfortunately the north Chili specimens, Nos.

53371-3 and 53379-89 are without date, but as the breeding asperities of all the males are in the same condition as those of the Shensi and Kansu specimens they are fully comparable. Of these 14 specimens, 12 are adult males and two adult females. The males are practically all uniform olive gray on the back with the warts pale (possibly red in life), but the regular pattern of spots can be discovered in most of them on the paratoid glands and on the tibia. In the two females the typical brown pattern of spots is strongly contrasted against the paler ground color. The Kansu and Shensi specimens are of a slightly paler ground color. Those from Kansu are all males and present an unbroken series of transition from a specimen (No. 39373) hardly distinguishable from the most uniform Chili male to one (No. 39369) with a pattern as contrasted as that of the Chili females. Among the Shensi specimens the adult female and the largest young one are pale with normal well-developed and contrasted pattern; the three smallest are also pale, but the dusky markings are less broad and on the back confined to rings around the pale (reddish?) warts; they are better defined on upper eyelid, lores, and legs.

It will thus be seen that we have no female or young specimens of the uniform dusky type, the males from the Kansu locality show a complete gradation between the two types of coloration which thus can not be said to be absolutely diagnostic of the two sexes. Nevertheless, the distinction is probably more or less general. Sowerby made the same observation in the field. In "Through Shen-Kan" he writes as follows (p. 112): "Radde's toad (*Bufo raddei*) is characteristic of the country. This amphibian does not attain any great size. The female is very prettily marked, somewhat resembling the natterjack of Europe; the male is of a dull greenish brown color, and does not possess the beautiful marking of the female. There can be no doubt of this animal's power to withstand drought. I have found it amongst the sand-dunes of Ordos, as well as in the loess hills of other parts. Specimens were secured in Kansu, within the famine area near Len-chow Fu. Here, the natives said, there had been no rain for three years. In spite of its frequenting such dry places, it thoroughly appreciates an abundant supply of water, as I have found them in the ponds and back-waters of rivers, not only while spawning but at all times of the year, excepting winter. The spawning season is regulated by the rains, and in a dry year I have known it to be postponed till July."

As Bedriaga<sup>5</sup> and Nikolski<sup>6</sup> have listed specimens in the Petrograd Museum (Nos. 1052, 1655, and 1658) collected by Potanin in North China and Mongolia as true *Bufo viridis*, I have naturally examined

<sup>5</sup> Wiss. Res. Przewalski Central-Asien Reis., Zool., vol. 3, sect. 1, pt. 1, 1898, p. 61.

<sup>6</sup> Fauna Rossij, Amph., 1918, pp. 101, 102.

all our specimens with the possibility in view that some of them might belong to this western form, but with negative results.

#### **BUFO MELANOSTICTUS Schneider**

For synonymy and illustration see Herp. Japan, 1907, pp. 72–73, figs. 58–61.  
Add:

WOLTERSTORFF, Abh. Mus. Magdeburg, vol. 1, 1906, p. 132 (Canton).—VOGT, Sitz. Ber. Ges. Naturf. Freunde, Berlin, 1914, p. 102 (Kwangtung).

Wolterstorff (see synonymy) seems to think that this species does not reach Fukien. However, six specimens collected by Sowerby in that province, including one without specific locality (No. 65267), four at Foochow (165328–9, 66427–8), and one at Fatsing (No. 65250), prove that the species is not rare there.

#### **Genus AELUROPHRYNE Boulenger**

1919. *Aelurophryne* BOULENGER, Rec. Indian Mus., vol. 16, December, 1919, p. 469 (type, *Bufo mammatus* Guenther).

#### **AELUROPHRYNE MAMMATA (Guenther)**

1896. *Bufo mammatus* GUENTHER, Ann. Mus. Zool. Acad. Sci. St. Pétersbourg, vol. 1, 1896, p. 208 (type-locality, Tung-so-lo [Tung-ngo-lo?], Kham plateau, Szechwan, China; types in Mus. St. Petersburg; G. Potanin, collector).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 370.—NIEDEN, Tierreich, vol. 46, Amph. Anura, pt. 1, 1923, p. 88.—*Aelurophryne mammata* BOULENGER, Rec. Indian Mus., vol. 16, December, 1919, p. 470 (Kashmir).

1917. *Rana pleskei* ANNANDALE, Rec. Indian Mus., vol. 13, 1917 (p. 417, figs. 1–2) (tadpoles; Kashmir, India) (not of Guenther).

Three specimens, one adult (No. 67833) and two adolescent ones (Nos. 67836–7), the former from Sungpan, the latter from the Yellow Dragon Gorge, east of this city, were collected by Mr. Graham, a most interesting addition to our collection.

#### **Family HYLIDAE**

##### **HYLA CHINENSIS Guenther**

To synonymy in Herpetology of Japan, 1907, p. 86, add:

*Hyla chinensis* STEINDACHNER, Wiss. Ergebn. Reise Széchenyi Ostasien, vol. 2, 1896, p. 507 (Shanghai).—WOLTERSTORFF, Abh. Mus. Magdeburg, vol. 1, 1906, p. 132 (Foochow; Nimrod Sound).—VOGT, Sitz. Ber. Ges. Naturf. Freunde, Berlin, 1914, p. 102 (Kwangtung).

*Hyla arborea*, var. *sinensis* GEE, Journ. N. China Asiat. Soc., vol. 50, 1919, p. 184 (Soochow).

Sowerby has sent eight specimens, old and young, from Fukien, viz., three from Foochow (Nos. 65337, 66403–4) and five from Futsing District. All have the characteristic black spots, even the youngest (80 mm. long).

**HYLA ARBOREA JAPONICA Guenther**

Herp. Japan, 1907, p. 76, pl. 9, figs. 1-3.

The material of tree toads received since the publication of the Herpetology of Japan is so insignificant that it throws very little light, if any, on the question of the distinctness and distribution of *H. arborea japonica*, *immaculata*, and *stepheni*. Nikolski has recently added another subspecies, *Hyla arborea ussuriensis*, based on a single specimen collected by Emeljanof in the neighborhood of Tchernigovki Village, in the Coast Province.<sup>7</sup> It is characterized by having the skin of the underside not granular but divided up into a mosaic of large polygonal plates and by having the third toe distinctly longer than fifth, etc. Not having seen any such specimen, I am unable to express any opinion as to the validity of this form.

Sowerby collected an adult male (No. 52354) in southern Manchuria on the Yalu River about 180 miles from its mouth. I am unable to distinguish it from Japanese specimens. The inner metatarsal tubercle, it is true, is rather large, and the digital disks perhaps rather small, but each can be matched in my Japanese series, though perhaps not in the same individual.

**HYLA STEPHENI Boulenger**

Herp. Japan, 1907, p. 84. Add to synonymy:

NIKOLSKI, Fauna Rossij, Amph., 1918, p. 149 (Ussuri country to Transbaicalia).

Two young specimens (Nos. 53367-8), largest 21 mm. long, were collected by Sowerby at Imien-po, northern Kirin, Manchuria, and are referred to under this heading in spite of the fact that I can make out no markings. The digital disks, however, are scarcely noticeable as such and the inner metatarsal tubercles are large.

I am now inclined to think that the three specimens from Mongolia in the Museum of the Philadelphia Academy alluded to in the Herpetology of Japan (p. 83), under the heading of *Hyla arborea immaculata*,<sup>8</sup> really are identical with Sowerby's Manchurian specimens.

**Family BREVICIPITIDAE****MICROHYLA EREMITA Barbour**

1858. *Diplopelma ornatum*, var. *B* GUENTHER, Cat. Batr. Sal. Brit. Mus., p. 50 (part only: Ningpo).

1864. *Diplopelma pulchrum*, GUENTHER, Rept. Brit. India, p. 417 (part only: Ningpo).

1882. *Microhyla ornata* BOULENGER, Cat. Batr. Sal. Brit. Mus., p. 165 (part only: Ningpo).—BOETTGER, Offenbach. Ver. Naturk., 24 und 25 Ber.,

<sup>7</sup> Fauna Rossij, Amph., 1918, p. 147.

<sup>8</sup> Described by Boettger from Shanghai.

1885, p. 162 (part only: Ningpo); Kat. Batr. Mus. Senckenberg, 1892, p. 23 (part: Dalanshan); Ber. Senckenberg. Naturf. Ges., 1894, p. 149 (Dalanshan and Chinhai, near Ningpo).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 370 (part only: Ningpo).

1920. *Microhyla eremita* BARBOUR, Occas. Pap. Mus. Zool. Michigan, No. 76, March 1, 1920, p. 3 (type-locality, Nanking, China; type, Mus. Comp. Zool. No. 5114; Cora D. Reeves, collector).

Sowerby collected a single specimen (No. 65338) at Shanghai. Thanks to the courtesy of Dr. Barbour, direct comparison with one of the paratypes of *M. eremita*, recently described by him from Nanking has enabled me to verify the identification. The National Museum also possesses several specimens (Nos. 52569–72) from Kiangyin, Province of Kiangsu, half-way between Nanking and Shanghai, presented by L. F. Moffett.

#### MICROHYLA FISSIPES Boulenger

1884. *Microphyla fissipes* BOULENGER, Ann. Mag. Nat. Hist., ser. 5, vol. 13, p. 397 (type locality, Taiwanfu, southern Formosa; type in British Museum); Ann. Mag. Nat. Hist., ser. 8, vol. 4, Dec., 1909, p. 495 (Kosempo and Kanshirei, Formosa).—BOETTGER, Offenbach. Ver. Naturk., 24 und 25 Ber., p. 162 (Formosa).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 369. (Taiwan).—STEJNEGER, Herpet. Japan, 1907, p. 88 (Formosa); Proc. U. S. Nat. Mus., vol. 38, May 3, 1910, p. 95 (Formosa).—VOGT, Sitz. Ber. Ges. Naturf. Freunde, Berlin, 1911, p. 181 (Formosa); 1914, p. 101 (Canton).

Of this species, originally described from Formosa, and recorded from southern China by Vogt in 1914, Mr. Sowerby has sent one from Futsing (No. 65256) and three from Yen-ping-fu (Nos. 65303–65305). I have carefully compared them with a large series from Formosa and can find no tangible difference. It is interesting to note that just as this species seems to be found in Formosa in the same locality as *M. heymonsi*, so Mr. Sowerby's lot of *M. fissipes* from Yen-ping-fu included also a specimen of *M. heymonsi*.

The discovery of these two species of Formosan Microhylas in Fukien is in perfect harmony with the close zoogeographic relationship of that island to the mainland. It will be recalled that in my paper on the Formosan Batrachians and Reptiles<sup>9</sup> I came to the conclusion that "all the [Formosan] batrachians which have Himalo-Chinese affinities have differentiated into more or less distinct species, while those of southern affinities have remained practically unaltered in the island." As *Microhyla* is a distinctly southern genus, with no Himalayan affinities, identity of the Fokien species with the Formosan ones is not surprising.

<sup>9</sup> Proc. U. S. Nat. Mus., vol. 38, 1910, p. 93.

**MICROHYLA HEYMONSI Vogt**

1911. *Microhyla heymonsi* VOGT, Sitz. Ber. Ges. Naturf. Freunde, Berlin, 1911, p. 181 (type locality Formosa; types in Berlin Mus.; Sauter, collector); 1913, p. 224.

A single specimen of this species hitherto known only from Formosa (No. 65302) is among the lot of *M. fissipes* collected by Mr. Sowerby at Yen-ping-fu Fukien. It is matched perfectly by a large series of Formosan specimens before me. The two species, which apparently occur together, are very distinct and easily differentiated.

**MICROHYLA GRAHAMII Stejneger**

1924. *Microhyla grahami* STEJNEGER, Occ. Pap. Boston Soc. Nat. Hist., vol. 5, July 21, 1924, p. 119 (type-locality, Suifu, Szechwan, China; type, U.S.N.M. No. 65936; Rev. D. C. Graham, collector).

*Diagnosis*.—Interorbital space almost twice as wide as upper eyelid; skin above, including head and legs, strongly tubercular; toes with mere rudiment of web at base and scant indication of lateral dermal margins; tips of digits very slightly widened; heel of extended hind leg reaches middle of eye; two metatarsal tubercles.

*Description of type specimen*.—Snout slightly longer than diameter of orbit; interorbital space about one and a half the width of upper eyelid; first finger much shorter than second, tips of all scarcely widened; toes with a rudiment of web at base and scant indication of lateral dermal margins, tips of digits very slightly widened, not expanded into disks, but with indication of a median groove on top; subarticular tubercles well developed; two metatarsal tubercles, prominent, rather small, outer larger than inner; hind limb being carried forward along the body, the tibio-tarsal joint reaches middle of eye; tibia longer than half the length of head and body; skin above, including upper surfaces of head and legs, strongly tubercular, the tubercles somewhat elongate and varying in size, arranged in regular longitudinal rows, the one on the median line almost a continuous string of smaller tubercles; under surfaces smooth, except a small granular area between the femurs; a groove from posterior angle of eye to insertion of foreleg where it bifurcates, bordered below by a series of tubercular glands.

*Color* (in alcohol): Dark drab; a darker, almost blackish dorsal mark between eyes, with a lateral projection between the forelegs, to middle of back where it bifurcates and continues to the groin, followed on the lower back by a chevron-shaped mark which continues on the upper surface of the femur; a dark bend from above the foreleg to the middle of the flanks; a well-marked blackish spot on the anal region; limbs, including digits, with dark crossbars, a pale oblique stripe from posterior angle of eye to foreleg; underside pale, densely spotted with dark gray, except on middle of belly.

## DIMENSIONS

mm.

Total length from snout to vent	18
Greatest width of body	7
Width of head at posterior angle of eye	5
Tip of snout to eye	3
Tip of snout to insertion of front leg	7.5
Diameter of eye	2.25
Foreleg	9.5
Vent to heel	15
Heel to tip of fourth toe	14
Outer metatarsal tubercle to tip of fourth toe	9.5
Tibia	10

*Remarks.*—Of this new species there is another specimen (No. 65937) besides the type. It is a millimeter longer, otherwise in most details identical, though the serial arrangement of the dorsal tubercles is not quite so regular.

The species seems to be smaller than the related ones, is quite rough above, and very much darker colored. The pattern is essentially that of *M. fissipes*, except that the dorsal mark is wider anteriorly and the lateral band shorter, starting only on the shoulder.

In the roughness of its upper surfaces it surpasses the *M. sowerbyi*, to be described next, but the rudimentary webs and lack of digital disks differentiate it at once.

It is with great pleasure that I dedicate this interesting novelty to its discoverer, Rev. D. C. Graham.

## MICROHYLA SOWERBYI Stejneger

1924. *Microhyla sowerbyi* STEJNEGER, Occ. Pap. Boston Soc. Nat. Hist., vol. 5, July 21, 1924, p. 119 (type-locality, near Yen-ping-fu, Fukien, China; type, U.S.N.M. No. 65309; A. de C. Sowerby, collector).

*Diagnosis.*—Interorbital space slightly wider than upper eyelid; skin above, including head and legs, densely tubercular; toes scant one-third webbed, with rather wide dermal margins and well-developed disks; heel of extended hind leg reaches between eye and tip of snout; two prominent, though small, subequal metatarsal tubercles.

*Description of type.*—Snout slightly longer than diameter of orbit; interorbital space slightly wider than upper eyelid; first finger much shorter than second, tips of all widened; toes with a well-developed web not quite one-third and rather wide dermal margins; tips widened into distinct disks with indication of a groove on top; subarticular tubercles prominent; two metatarsal tubercles, subequal, small, scarcely larger than a subarticular tubercle, prominent and rather pointed; hind limb being carried forward along the body, the tibio-tarsal joint reaches between the eye and the tip of snout; skin

above, including upper surfaces of head and legs, densely tubercular, the tubercles apparently without any definite arrangement in rows, except perhaps on the tibia; a slight fold from eye to foreleg, chiefly indicated by a groove in front of it; underneath smooth, except belly, which is granular.

Color (in alcohol): Drab gray above, whitish beneath; a blackish zigzag crossband from shoulder to shoulder, overlying a fainter, more brownish median dorsal mark from between eyes to sacrum, with a lateral oblique projection extending backwards half way between axilla and groin; no anal or post-femoral spots; legs more or less distinctly cross-barred; no trace of a dark lateral band on head or body; no pale line down the middle of the back.

## DIMENSIONS

	mm.
Total length from snout to vent-----	22
Greatest width of body-----	11
Width of head at posterior angle of eye-----	6.5
Tip of snout to eye-----	3
Tip of snout to insertion of front leg-----	8.5
Diameter of eye-----	2.5
Fore leg -----	12
Vent to heel-----	22
Heel to tip of fourth toe-----	18
Outer metatarsal tubercle to tip of fourth toe-----	11.5
Tibia -----	12

*Remarks.*—This new species, which I take great pleasure in naming for its discoverer, does not seem to be very closely related to any of the known species. In its dorsal tubercles, though not quite as rough, it recalls *M. grahami*, but in other characters it differs widely. As in so many *Microhylas* the color pattern is quite characteristic. In certain respects it recalls *M. fissipes*, but the lateral projection of the median dorsal spot are more anterior, and the dark band on the sides of head and body is entirely absent.

## Genus KALOULA Gray

1831. *Kaloula* GRAY, Zool. Miscell. (p. 38) (monotype, *K. pulchra*).  
 1838. *Hyladactylus* TSCHUDI, Mém. Soc. Sci. Nat. Neuchâtel, p. 48 (type, *H. baleatus*).  
 1838. *Hyladactyla* TSCHUDI, Mém. Soc. Sci. Nat. Neuchâtel, p. 85 (lapsus).  
 1841. *Hylaedactylus* DUMÉRIL and BIBRON, Erpét. Gén., vol. 8, p. 732 (emendation).  
 1841. *Plectropus* DUMÉRIL and BIBRON, Erpét. Gén., vol. 8, p. 736 (type, *P. pictus*).  
 1848. *Pelida* GISTEL, Naturg. Thierr., p. xi (substitute for *Hyladactylus*).  
 1863. *Calohyla* PETERS, Mon. Ber. Berlin Akad. Wiss., 1863, p. 454 (emendation).  
 1863. *Halonectes* PETERS, Mon. Ber. Berlin Akad. Wiss., 1863, p. 454 (type, *H. conjunctus*).  
 1864. *Callula* GUENTHER, Rept. Brit. India, p. 436 (emendation).

**KALOULA RUGIFERA Stejneger**

1924. *Kaloula rugifera* STEJNEGER, Occ. Pap. Boston Soc. Nat. Hist., vol. 5, July 21, 1924, p. 119 (type-locality, Kiating, Szechwan, China; type, U.S.N.M. No. 65520; Rev. D. C. Graham, collector).

*Diagnosis.*—Toes nearly one-third webbed at the base; fingers dilated into well-developed truncated disks; upper surface and sides with numerous elongated warts; interorbital space much wider than upper eyelid; both metatarsal tubercles large, with cutting edge, outer transverse.

*Description of type specimen.*—Tongue oval, slightly emarginate behind; behind the choanae on each side a curved strong ridge without teeth extending outward beyond the choanae and converging backward toward the median line, separated by a narrow interspace; snout rounded, slightly longer than diameter of eye; nostrils nearer the tip of the snout than the eye, the latter distance equaling the internarial distance; canthal ridge indicated; lores slightly concave; interorbital space much wider than upper eyelid; fingers slender with well-developed truncated disks, second equaling fourth, first somewhat shorter; subarticular and palmar tubercles prominent, the one at the base of the first finger with free rounded edge; toes long and slender, tips distinctly swollen, about one-third webbed at base; subarticular tubercles well developed; both metatarsal tubercles strongly developed with free cutting edges, the inner much larger, the outer transverse; extended hind leg reaches beyond the fore leg and eye; skin of upper surface and sides rough with numerous elongate wrinkled tubercles; underside more or less transversely wrinkled; preanal region granular; a slight dermal fold indicated by a faint groove from eye to shoulder; no fold across the top of head.

Color (in alcohol): Dark brownish gray above with a broad pale band, interrupted in the middle, across the neck between the fore legs, this band edged with a series of small black spots: similar black spots scattered over the upper surface and forming a narrow band across supraorbital region, a line on upper lip and indication of cross bars on the legs and feet; underside light brownish gray with numerous roundish white spots on chin and throat; all tubercles on the underside of the feet distinctly whitish.

## DIMENSIONS

	mm.
Total length from snout to vent-----	42
Greatest width of head-----	16.5
Tip of snout to eye-----	4.5
Interorbital width-----	4.5
Width of upper eyelid-----	3
Fore leg-----	30
Vent to tip of inner metatarsal tubercle-----	42
Tip of inner metatarsal tubercle to tip of fourth toe-----	17

*Remarks.*—This novelty is somewhat intermediate between *Kaloula pulchra*, from Hongkong and southern China and *Kaloula verrucosa*, described by Boulenger<sup>10</sup> from Yunnanfu.<sup>11</sup> The web between the toes is intermediate in extent, being larger than in *K. pulchra*<sup>12</sup> but shorter than in *K. verrucosa*, as represented by two specimens in our Museum from the type locality, which were obtained from the Museum of Comparative Zoölogy, though closely approaching that of No. 65520. In dilation of the fingers it agrees with *K. pulchra*, but in the rugosity of its upper surface it even surpasses *K. verrucosa*. It differs from the latter, and judging from the descriptions, also from the former, in the longer snout and better developed canthus rostralis. It agrees again with *K. pulchra* in the wider interorbital space. It differs from both decidedly in the pattern of coloration which is peculiar and characteristic.

Another *Kaloula* has been described ten years ago as *K. tornieri*,<sup>13</sup> from Korea, the most easterly extension of the genus known. It differs by having no well-defined disks on the fingers, by a small, rounded outer metatarsal tubercle, etc., and does not seem to be nearly related to the above.

That the new species belongs to the genus *Kaloula* I have no doubt, in spite of the fact that the sternal apparatus resembles very closely the figure given by Boulenger<sup>14</sup> of that of *Cacopus systema*. The inner nares and the palatal ridges agree so well, however, with our specimens of *K. verrucosa*, that a separation from the genus *Kaloula* is excluded. The terminal phalanx of the digits is shaped much like that of *K. verrucosa*.

## Family RANIDAE

### RANA NIGROMACULATA Hallowell

Synonymy, Herp. Japan, 1907, p. 94, to which add:

*Rana esculenta* subsp. *chinensis* WOLTERSTORFF, Abh. Mus. Magdeburg, vol. 1, 1906, pp. 130, 135 (Foochow; Pingsiang, and Kiukiang, Kiangsi; Nimrod Sound, Chekiang; Shanghai; Nanking, Peking, Tsing-tao, Shantung; Masampo and Chemulpo, Korea).

*Rana esculenta* var. *chinensis* BOULENGER, Rec. Indian Mus., vol. 20, 1920, p. 88 (Shanghai; Chusan; Ningpo; Mts. n. of Kiukiang).

*Rana chinensis* BOLKAY, Allatt. Közl. Budapest, vol. 8, 1909 (p. 53, pl. 8); Proc. Washington Acad. Sci., vol. 13, 1911, p. 67, pl. 6 (critical).

<sup>10</sup> Ann. Mag. Nat. His., ser. 7, vol. 13, February, 1904, p. 131.

<sup>11</sup> This species has also been reported from Tsingtau, Shantung (*Callula verrucosa* WOLTERSTORFF, Abh. Mus. Madgeburg, vol. 1, 1906, p. 145). Whether identical with the Yunnan form, or distinct, remains to be seen. Doctor Wolterstorff indicates various differences.

<sup>12</sup> As figured by Boulenger. Cat. Batr. Sal. Brit. Mus., 1882, p. 170.

<sup>13</sup> *Callula tornieri* VOGT, Sitz. Ber. Berlin Akad. Wiss., 1913, p. 219.

<sup>14</sup> Cat. Batr. Sal. Brit. Mus., 1882, p. 174.

*Rana esculenta* SOWERBY, in Clark and Sowerby, Through Shen-Kan, 1912, p. 112 (Shensi).—GEE, Journ. N. China Asiat. Soc., vol. 50, 1919, p. 184 (Soochow).

*Rana nigromaculata* ANNANDALE, Mem. Asiat. Soc. Bengal, vol. 6, 1917, (p. 140, pl. 6, fig. 4).—NIKOLSKI, Fauna Rossij, Amph., 1918, p. 34 (Or-dos; Wuchangfu, Hupeh; Khingan Mts; etc.).

Of this widely distributed and common frog most of the recent collections contain numerous examples, as shown by the following enumeration.

Sowerby collected three specimens (Nos. 52360-2) in southern Manchuria at the Yalu River about 180 miles from its mouth; eight specimens (Nos. 39346-52) in Shensi at Yenanfu, and 20 miles east of Hai-shin-ssu; seven specimens (Nos. 65225-8, 66352-4) at Shanghai; eighteen (Nos. 65330, 66386-402) at Foochow, and three (Nos. 65292-4) near Yenpingfu, Fukien. One (No. 63202) was extracted from the stomach of a snake collected by Dr. Lewis R. Thompson in the southwestern part of Hunan province. Rev. Graham sent eleven from Szechwan, seven (Nos. 65931, 66642, 66785-9) from Suifu, the others (Nos. 65924-7) presumably from the same locality. L. I. Moffett collected two specimens (Nos. 52585-6) at Kiangyin, Kiangsu.

#### RANA PLANCYI Lataste

Synonymy, see Herp. Japan, 1907, p. 101, to which add:

BOETTGER, Offenbach. Ver. Naturk., 24-25 Ber., 1885, p. 160; Kat. Batr. Mus. Senckenberg., 1892, p. 4 (Lushan Mts. near Kiukiang; Shanghai; Hankow); Ber. Senckenberg. Naturf. Ges., 1894, p. 138 (Hankow); p. 140 (Lushan Mts.); p. 145 (Shanghai); p. 147 (Dalanshan, near Ningpo).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 368.—WOLTERSTORFF, Abh. Mus. Magdeburg, vol. 1, 1906, p. 130 (Ping-shiang; Nimrod Sound, Chekiang; Kiukiang).—GEE, Journ. N. China Asiat. Soc., vol. 50, 1919, p. 184 (Soochow).

ANNANDALE, Mem. Asiat. Soc. Bengal, vol. 6, 1917, p. 145 (Tai-hu Lake, Prov. Kiangsu).—BOULENGER, Rec. Indian Mus., vol. 20, 1920, p. 85 (China and Formosa).

There are now in the National Museum good series of this species both from Formosa and the Chinese mainland. An examination of this material demonstrates that the differences which I indicated<sup>15</sup> between specimens from Formosa and Shanghai do not hold and are of a purely individual character. Several of the specimens have well-developed glandular tubercles on the back between the dorso-lateral folds, but they do not assume the shape of elongated folds as in *R. nigromaculata*. The black and white band on the posterior aspect of the thigh is characteristic of *R. plancyi*. Our series now includes two specimens (Nos. 65331 and 65333) from Foochow, and one (No. 65258) from Futsing also in Fukien, and 12 specimens (Nos.

<sup>15</sup> Herp. Japan, 1907, p. 101.

65236–46, 66351) from Shanghai, all collected by Mr. Sowerby. In addition we have eight specimens (Nos. 52576–82, 52584) from Kiangyin, Kiangsu, collected by L. I. Moffett.

#### RANA ASIATICA (Bedriaga)

1853. *Rana cruenta* MIDDENDORFF, Sibir. Reise, vol. 2, pt. 2, p. 249, pl. 26, figs. 5–7 (Jakutsk, Siberia) (not of Pallas).

1876. *Rana temporaria*<sup>16</sup> STRAUCH, in Przewalski's Mongoliya i Strana Tangutov, vol. 2, pt. 3, p. 53 (Kansu; Ordos) (not of Linnaeus).—GUENTHER, Ann. Mus. Zool. St. Pétersbourg, vol. 1, 1896, p. 206 (Sungpan, Szechwan).

1885. *Rana japonica* BOETTGER, Offenbach. Ver. Naturk., 24–25 Ber., p. 150 (Kansu; Ordos; Szechwan) (not of Guenther).—SOWERBY, in Clark and Sowerby, Through Shen-Kai, 1912, p. 112 (North Shensi; Kansu).

1898. *Rana temporaria*, var. *asiatica* BEDRIAGA, Wiss. Res. Przewalski Central-Asien Reis., Zool., vol. 3, sect. 1, Amph. Rept., pt. 1, May 15, 1898, p. 23, pl. 1, fig. 4–4b (type-locality, Kansu and Ordos, Mongolia; cotypes, Petrograd Mus. Nos. 928, 929; Przhevalski, collector).

1909. *Rana bacthyana* KASTCHENKO, Ann. Mus. Zool. St. Pétersbourg, vol. 14, p. 129 (type-locality, Bachtı, Semiryetchensk, Siberia; types in Univ. Tomsk).

1914. *Rana asiatica* NIKOLSKI, Trudi Troitsko-Savsk. Kiakht. Otd. Geogr. Obshtch., vol. 15, 1914 (p. 33) (Transbaikalia); Fauna Rossij, Amph., 1918, p. 62 (Southern Siberia, Davuria, Ordos, Kansu, etc.).

The exact relation of this form to the typical *Rana temporaria*, which inhabits the northern regions from the Atlantic Ocean to the Pacific, is not quite clear. In the desert regions from the Tian-Shan eastwards a form occurs apparently distinguished by longer snout, slightly longer hind legs, slightly more excised webs and more posteriorly located vomerine teeth. It is not always easy to determine, especially with indifferently preserved material, to which form a given specimen may belong. This is evident from an inspection of the lists of specimens given by Bedriaga and Nikolski, which shows that these eminent authorities have disagreed materially in the reference of the individual specimens, and that both authors enumerate specimens from the same locality under the separate names. Thus Bedriaga (p. 17) refers Petrogr. Mus. No. 1055, from the River Kungess in the Tian-shan to *Rana temporaria* and No. 1056 from the same locality to *R. asiatica*, while Nikolski (Fauna Rossij, Amph., p. 39) places both numbers under *R. temporaria*. Bedriaga regards the two specimens of No. 932, from Kansu, as typical *R. temporaria*; Nikolski has them under *R. asiatica*, and also

<sup>16</sup> In the Herpetology of Japan, p. 113, I explained the trivial term *temporaria* as signifying "temporary, in the present case, perhaps, in the sense of changeable." I have since come across the following paragraph in Gesner's "De Amphibiis" (1560, p. 360): "Latent hybernis mensibus in terra Ranae omnes exceptis temporariis istis minimis, qui latent in coeno, et reptant in viis ac ripis," showing that these frogs were called "temporary" because they were believed to last only during the summer time and not to hibernate like the other frogs.

No. 1056. Bedriaga has at least one of the eight specimens of No. 1501, from the River Braga-gorgi, as *R. asiatica*, while Nikolski has three out of the same batch under *R. asiatica* and three under *R. temporaria*. Moreover, Bedriaga refers Middeudorff's specimens from Udkoi Ostrog to *R. asiatica*, while Nikolski keeps them in *R. temporaria* where, I have no doubt, they really belong.

Mehely's suggestion<sup>17</sup> that Middeudorff's Aldan and Udkoi specimens, as well as Bedriaga's *R. asiatica*, really are *Rana arvalis* I simply mention to show how divergent the opinions are as to these frogs.

Recently<sup>18</sup> Bouleenger has made *R. japonica* include specimens from practically the whole of China and Japan, from Canton and Yumianfu to Yezo and the mouth of the Amur. This disposition of the east Asiatic grass frogs does not seem to meet the requirements of the case, and in the absence of a discussion and disposal of *R. martensi* and of *R. asiatica* I am unable to accept his view, at least for the present.

In this uncertainty I have preferred to follow Nikolski in treating this form binomially.

This is the form which Sowerby found all along his route with Colonel Clark in Shausi, northern Shensi, and Kansu in 1905 and 1909. A fine series, including specimens from Taiyuanfu, Shansi (Nos. 39326-30), Yulinfu, Shensi (Nos. 39331-2), 50 miles east of Yenanfu, Shensi (Nos. 39360-6), 25 miles northeast of Chingting-chow, Kansu (Nos. 39354-9), and 20 miles east of Kingyangfu, Kansu, at Ho-shin (No. 39367) testify to his zeal and skill as a collector and observer. There are also in the collections received from him later on specimen obtained by A. L. Hall in northeastern Chili, at Hei Sui, close to the Mongolian border (Nos. 53374-8) and by himself in Manchuria, at I-mieu-po, North Kirin (No. 53370).

#### RANA CHENSINENSIS David

This, as will be shown below, is the same as *Rana amurensis* Bouleenger in the Herpetology of Japan, 1907, p. 119. To the synonymy there given add:

1875. *Rana chensinensis* DAVID, Journ. Trois. Voy. Chinois, vol. 1, p. 159  
(type locality, Inkiapo, Valley of Laoyu, Tsinling Mts., southern Shensi; types in Paris Mus.; A. David, collector).

*Rana amurensis* ELPATJEWSKY and SABANIAKOV, Zool. Jahrb. Syst., vol. 24, 1906, p. 261 (Transbaikalia).—BOULENGER, Proc. Zool. Soc. London, 1907, p. 414 (Sakhalin).—BARBOUR, Proc. New England Zool. Club, vol. 4, Nov. 24, 1909, p. 59 (West Tai-pai-shiang district, Northern China).

1912. *Rana japonica* SOWERBY, in Clark and Sowerby, Through Shen-Kan, p. 112 (north Shensi; Kansu) (part; not of Gueuther).

<sup>17</sup> Zichy's Dritte Asiat. Forschungsreise, vol. 2, Zool., 1901, p. 66.

<sup>18</sup> Rec. Indian Mus., vol. 20, 1920, p. 93.

1918. *Rana amurensis amurensis* NIKOLSKI, Fauna Rossij, Amph., p. 80 (Vladivostok; Shmakovskaya, Ussuri).

1918. *Rana amurensis kukunoris* NIKOLSKI, Fauna Rossij, Amph., p. 82 (type locality, Lake Kokonor, Tibet; cotypes, Mus. Petrograd, no. 1500; Przhevalski, collector).

*Rana amurensis* was originally described by Boulenger from specimens collected in the Russian Coast province. It was afterwards (1908) recorded by Bedriaga from material collected by Przhevalski and Grum-Grzymailo at Kokonor. Neither of these authors had seen specimens from the other's locality.

Nikolski was able to compare specimens from both localities which are more than 1,500 miles apart, and came to the conclusion that those from Kokonor were distinguishable from the typical Ussuri form by having the skin of the sides and belly smooth, back furnished with elongate tubercles, belly unspotted, and the inner metatarsal tubercle less than one-half the length of first toe.

While thus Bedriaga and Nikolski were unable to compare specimens from these extreme ends of the range of the species, I on the other hand have only specimens from the intermediate territory. Dr. Thomas Barbour, in 1909, recorded several specimens from the West Tai-pai-shiang district of Northern China. This locality which seems to be the same as Tei-pai-shan (also spelled Ta-pai-shan or Thaé-péy-chan), in the Tsinling Mountains south of Sianfu, Shensi, is not far from the place 15 miles south of Sianfu, where Sowerby collected two specimens (Nos. 39315–6) on February 26, 1909. Thanks to the courtesy of Doctor Barbour I have been able to compare the two grown specimens in the Museum of Comparative Zoölogy with ours and find them to agree in all essential points, and I have no doubt that they all represent *R. chensinensis* (=*amurensis*). To this form I also refer four specimens (Nos. 52363–6) taken by Sowerby in southern Manchuria on the Yalu River about 180 miles from its mouth, and five specimens, also collected by him in the Hsin-Lung-Shan district, Imperial Hunting Grounds, Chilili, 65 miles northeast of Peking, during the month of August, 1917. In most of these I find the skin on the sides and below rather smooth, the venter immaculate and the inner metatarsal tubercle rather less than one-half the inner toe, but the tubercles on the back are not elongated. In some respects therefore these Chinese specimens are intermediate and cast doubt upon the validity of the subspecies *kukunoris*.

The change of name of this species from *R. amurensis* to *R. chensinensis* is due to the discovery of the fact that Père David in the account of his trip from Sianfu to the Tsinling Mountains described this species under the latter name from some specimens caught on

November 19, 1872, in a small spring at an altitude of more than 1,000 meters near Inkiapo in the valley of Laoyu, Tsingling Mountains. The two specimens (Nos. 39315-6) collected by Sowerby on February 26, 1909, in a mountain stream 15 miles south of Sianfu, at an altitude of 1,500 feet are therefore practically topotypes of Père David's species. It is interesting to compare Mr. Sowerby's color description of some of his frogs as being "yellowish-pink beneath, shading into red on the under surfaces of the legs" with David's "d'un beau jaune au ventre, avec le dessous des bras rouges."

**RANA JAPONICA (Guenther)**

Herpetology of Japan, 1907, p. 107, pl. 11, fig. 1. Add to synonymy:

1870.—*Rana silvatica* SWINHOE, Proc. Zool. Soc. London, 1870, p. 412 (Ichang, Hupeh) (not *R. sylvatica* LECONTE).

*Rana japonica* STEJNEGER, Proc. Washington Biol. Soc., vol. 37, Feb. 21, 1924 p. 70 (Japan).

While writing the Herpetology of Japan, I had serious doubts about *R. japonica* being found outside of Japan, not having seen any Chinese specimens myself. However, I have now before me two specimens (U. S. Nat. Mus. Nos. 66459-60) collected by Sowerby at Hangchow, Chekiang, and one from Shin-Kai-Si, Mount Omei, Szechwan, collected by Mr. Graham (No. 66547), which I am unable to separate from Japanese specimens. It is, therefore, likely that the records of *R. japonica* from Ningpo, Chin-hai, Nanking, Shanghai, Nimrod Sound, Kiukiang, and Ping-shiang correctly refer to this species. On the other hand, I can not accept the view that the Peking and other northern Chinese specimens referred to it belong here. They are probably either *R. chensinensis (amurensis)* or *R. asiatica*.

**RANA LONGICRUS Stejneger**

1898. *Rana longicrus* STEJNEGER, Journ. Sci. Coll. Tokyo, vol. 12, pt. 3, 1898, p. 216 (type locality, Taipa, Formosa; type, Sci. Coll. Mus. Tokyo, No. 26; T. Tada, collector); Herpet. Japan, Bull. U. S. Nat. Mus., No. 58, 1907, p. 104; Proc. U. S. Nat. Mus., vol. 38, 1910, p. 95 (Formosa); Proc. Washington Biol. Soc., vol. 37, Feb. 21, 1924, p. 77 (Formosa).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 369 (Formosa).—BOULENGER, Rec. Indian Mus., vol. 20, 1920, p. 95 (Ching Fung Lin, Fukien).

Boulenger's record of this species as occurring in Fukien is corroborated by a specimen collected by Mr. Sowerby at Foochow (No. 65327). Thus one more species is added to the list of batrachians which Formosa has in common with the mainland opposite.

From the list of measurements of this specimen given below the interorbital space as compared with that of the type appears to be much narrower relatively to the eyelid, and the latter wider, a dis-

crepancy also apparent in the figure of the type<sup>19</sup>, but that may be due to a difference in the state of preservation of the two specimens, as the total width between outer edges of eyelids, 10 mm., is identical in both.

## DIMENSIONS

	mm.
Snout to vent	48
Snout to posterior edge of tympanum	16
Snout to corner of mouth	14.5
Width of head	14.5
Diameter of eye	5
Width of upper eyelid	3.5
Interorbital width	3
Eye to nostril	4
Eye to end of snout	7.3
Diameter of tympanum	3
Fore limb	28
Elbow to tip of longest finger	21
Hind limb	91
Vent to tip of longest toe	95
Thigh	24
Tibia	30
Inner metatarsal tubercle	2
Distance between dorso-lateral folds	8.3

## RANA RICKETTI Boulenger

1899. *Rana ricketti* BOULENGER, Proc. Zool. Soc. London, 1899, p. 168, pl. 19, fig. 2 (type locality, Kuatun, Fukien; cotypes in British Mus.; J. D. La Touche, collector); Rec. Indian Mus., vol. 20, 1920, p. 216 (Fukien; Man Son Mountains, Tonkin, near Kwangsi).—VOGT, Sitz. Ber. Ges. Naturf. Freunde, Berlin, 1914, p. 100 (Kwangtung).

Mr. Sowerby collected a single specimen (U.S.N.M. No. 65266) near Yenpingfu, Fukien. Total length is 53 mm., consequently as large as the Tonkin specimens measured by Boulenger and considerably larger than the types (32 and 38 mm.).

## RANA ADENOPLEURA Boulenger

1909. *Rana adenopleura* BOULENGER, Ann. Mag. Nat. Hist. (ser. 8), vol. 4, December, 1909, p. 492 (type locality, Fuhacho village, 4,000 feet altitude, Formosa; cotypes in Brit. Mus.; H. Sauter, collector); Rec. Indian Mus., vol. 20, 1920, p. 139 (Formosa).

A single specimen (No. 65248) of this rare frog, originally described from Formosa, was collected by Sowerby at Yenpingfu, Fukien, thus adding still another to the species of batrachians common to this province and Formosa. It agrees closely with Boulenger's description, except that the dorso-lateral fold starts from the upper eyelid and not "from above the tympanum." To his description I may add that the disks of the toes are broadly lance-

<sup>19</sup> Herp. Japan, fig. 81, p. 104.

olate, pointed anteriorly, and the horizontal groove very marked. A series of measurements of this interesting specimen is appended.

	mm.
Snout to vent	45
Length of head	16
Width of head	15.5
Snout to eye	8
Eye	5
Interorbital width	3.7
Upper eyelid	4
Tympanum	4
Fore leg	27
Hind leg	77
Tibia	24
Vent to tip of longest toe	80
First toe	6
Inner metatarsal tubercle	2.5

#### RANA GUENTHERI Boulenger

1867. *Hylorana malabarica* STEINDACHNER, Reise Novara, Zool., vol. 1, Amph., p. 48 (Hongkong) (not of Duméril and Bibron).

1888. *Rana guentheri* BOULENGER, Cat. Batr. Sal. Brit. Mus., p. 48, pl. 4, fig. 2 (type locality, Amoy, China; syntypes in Brit. Mus.; R. Swinhoe, collector); Rec. Indian Mus., vol. 20, 1920, p. 133 (Amoy, China; Tonkin; Annam).—BOETTGER, Offenbach. Ver. Naturk., 24–25 Ber., 1885, p. 159 (Amoy); Ber., 1888, p. 95; Ber. Senckenberg. Naturf. Ges., 1894, p. 135 (Hainan); p. 137 (Hongkong); Kat. Batr. Mus. Senckenberg., 1892, p. 10 (Hainan; Hongkong, Canton).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 309.—WOLTERSTORFF, Abh. Mus. Magdeburg, vol. 1, 1906, pp. 126, 131, 144 (Pingshiang, Kiangsi; Canton).—VOGT, Sitz. Ber. Ges. Naturf. Freunde, Berlin, 1914, p. 100 (Kwantung).

A fine large male (total length 86 mm.), with large vocal sacs and humeral glands (No. 65332) a female, 77 mm. (No. 66465) and two young ones 24 and 22 mm. (No. 66466–7), were collected by Sowerby at Foochow, Fukien. Two half-grown specimens (Nos. 63413 and 65944) 64 and 57 mm. long, and a young one (No. 65935) 28 mm. long, were taken in Szechwan by Rev. D. C. Graham, the last mentioned at Suifu, the other probably at the same place. A fine male (No. 66848) has recently been received from Prof. C. Ping. It was collected at Nanking.

#### RANA TIBETANA Boulenger

1917. *Rana tibetana* BOULENGER, Ann. Mag. Nat. Hist. (8 ser.), vol. 20, Dec. 1917, p. 414 (type locality, Yin-tsin-wau, Wassu State, Tibet; type in Brit. Mus.); Rec. Indian Mus., vol. 20, 1920, p. 70 (Yin-tsin-wan).

A single excellently preserved specimen of what I take to be Boulenger's *R. tibetana* was collected by Rev. D. C. Graham at Shin-kai-si, Mount Omei, Szechwan (U. S. Nat. Mus. No. 64423). At first glance it recalls *Rana rugosa* of Japan, but an inspection of

the hind feet at once discloses that it belongs to an entirely different group of the genus.

About five closely allied forms have been described or recorded from the surrounding regions, namely, *R. feae*, *yunnanensis*, and *phrynoides* from Yunnan, *spinosa* from southern China south of the Yangtse, and *tibetana* from a locality in Tibet. Of these the description of the last mentioned species agrees in almost all particulars with our specimen. It has a distinct tympanum which is about 0.6 the diameter of the eye; a tarsal fold; the tibio-tarsal articulation reaches the anterior angle of eye; the tibia is  $3\frac{1}{4}$  times as long as broad, and about twice in length from snout to vent; first finger is longer than second; tips of toes swollen into small disks; inner metatarsal tubercles narrow, about 0.6 length of inner toe, no outer metatarsal tubercle; canthus rostralis quite distinct; loreal region concave; nostril nearer the eye than the end of the snout; distance between nostrils greater than interorbital width which is less than upper eyelid; heels overlapping; barely trace of a fold across the head behind the eyes, but a strong glandular fold from the eye to the shoulder. The upper parts in the type which is hitherto the only museum specimen recorded of *R. tibetana*, are described as "rough with granules and numerous round or oval warts tipped with black horny spinules." The wartiness of the Mount Omei specimen is apparently even more pronounced, for the skin of the whole upper surface resembles that of *R. rugulosa*, being densely granular with elongate narrow warts, 2 to 3 millimeters long, and arranged in about 8 fairly regular series on the back. The warts on the sides and upper surface of legs are shorter, but also arranged more or less serially, giving the whole upper surface a very rough appearance.

With regard to the type locality as given by Boulenger, I have failed to locate any Yin-tsin-wau or -wan in Tibet proper, nor a Wassu State. There is a Yin-tsin at the extreme eastern end of Szechwan in or near the Wu-shan range, but that is not likely to be the locality intended. There is, however, indicated on some maps an independent tribe (or state) Wasu or Wa-ssu in Central Szechwan near which a locality Wenchwan. Under the circumstances I feel that my identification of the species does no violence to the probable geographical distribution of this interesting frog, especially as Szechwan apparently has encroached upon Tibet by the absorption of the various independent kingdoms.<sup>20</sup>

A table of measurements of our specimen is appended for comparison with the dimensions given by Boulenger of the type. I have tried as far as possible to conform to his directions for taking the measurements.

<sup>20</sup> See Rockhill, Journ. Mongolia Tibet, 1894, p. 370.

## DIMENSIONS

	mm.
Tip of snout to vent	47
Length of head	16
Width of head	22
Snout	6
Eye	6
Width between nostrils	4.5
Interorbital width	4
Width of upper eyelid	4.7
Tympanum	3.5
Foreleg	24
First finger	5.5
Second finger	4.5
Third finger	7.5
Fourth finger	5
Hind leg	73
Tibia	24.5
Width of tibia	22.5
Foot	22.5
First toe, from metatarsal tubercle	6
Inner metatarsal tubercle	3.7
Fifth toe shorter than third	6.8
Fifth toe shorter than fourth	2

## RANA EMELJANOVI Nikolski

1913. *Rana emeljanovi* NIKOLSKI, Ann. Zool. Mus. St. Pétersbourg, vol. 18, 1913, p. 148 (type locality, Ilialpo,<sup>21</sup> Manchuria; type in Mus. Univers. Kharkof; Dr. Emeljanof, collector).

1918. *Rana emeljanowi* NIKOLSKI, Fauna Rossij, Amph., p. 83, pl. 2, fig. 2, (Iliampo).

Mr. Sowerby collected three good specimens of this interesting species on the north bank of Yalu River, the boundary between Manchuria and Korea, about 180 miles from its mouth. It is closely related to the Japanese *Rana rugosa* as noted by the original describer.

## RANA SPINOSA David

1858. *Rana kuhlii* GUENTHER, Cat. Batr. Sal. Brit. Mus., p. 8 (part: Ningpo); Rept. Brit. India, 1864, p. 404 (part) pl. 26, fig. A (Ningpo).

1872. *Rana latrans* DAVID, Nouv. Arch. Mus. Hist. Nat. Paris, vol. 8, Bull., p. 85 (type locality "Cascades de Kiangsi") (not of Steffen, 1815).

1875. *Rana spinosa* DAVID, Journ. Trois. Voy. Chinois, vol. 2, p. 253 (type locality, Ouang-mao-tsae, prov. Kiangsi).—BOULENGER, Rec. Indian Mus., vol. 20, 1920, p. 74 (China south of the Yangtse Klang).—SMITH, Rec. Indian Mus., vol. 26, March 1924, p. 137 (tadpoles; peak at Hongkong).

1889. *Rana boulengeri* GUENTHER, Ann. Mag. Nat. Hist., ser. 6, vol. 4, September, 1889, p. 222 (type locality, Ichang, Hupeh; cotypes in Brit. Mus.; A. E. Pratt, collector); in Pratt's To Snows of Tibet, 1892, p. 243 (Ichang).—BOULENGER, Proc. Zool. Soc. London, 1899, p. 166 (Kuatun, Fukien).

<sup>21</sup> So written in the original description. In his Fauna Rossij, Amph., 1918, Nikolski twice spells it Iliampo. It is said to be a station on the East Chinese Railroad, but I have been unable to locate it. I have only found a station Imenpo on the road between Harbin and Vladivostok.

A splendid series of ten adults (U. S. Nat. Mus. Nos. 64884–93) of this very large frog was collected during the late autumn of 1921 by Sowerby in the upper Min River basin, at an altitude of about 5,000 feet, consequently not far from the type locality of the species. Three equally large specimens (Nos. 64647–9) collected by C. R. Kellogg on August 10 of the same year supplement the above and give a good demonstration of the variability of this species. The more variable parts seem to be the interorbital width and the relative distance of the nostrils between the eye and the tip of the snout, but with the looseness of the skin it is very difficult to give exact measurements which are of value to others than the one taking them.

The males have the breast studded with white semiglobular tubercles, which in most of them are surmounted by a black conical spine. Similar spiny tubercles closely crowded together form pads at the tip of the inner metacarpal tubercle, which is enormously developed, the upper and inner sides of first and second fingers and inner side of third finger. The largest specimen, a male (No. 64884), measures 115 mm. in total length from tip of snout to vent.

The observations made by Mr. Sowerby on the habits of this species coincide with those recorded by Père David, who discovered the species in the high mountains dividing the province of Kiangsi from Fukien. In his letter of January 27, 1922, Mr. Sowerby writes that "The large frogs were taken amongst the rocks in the stream beds at an altitude of 5,000 feet," and that "they are considered a great delicacy by the Chinese." Mr. Kellogg, writing from Foo-chow, adds that "they seem fairly common, as I have seen large numbers of them for sale at different times, though they are rare enough to bring a better price in the markets than the common frogs."

Besides the above large specimens, Mr. Sowerby sent a very young one (No. 65249), which he collected at Yenpingfu, Fukien, and which I refer to this species with but little doubt. It is only 26 mm. long, but it has already a very strongly developed inner metacarpal tubercle; in addition the distance between eye and nostril is very short, so that I do not think it can be referred to *R. kuhlii*.

#### RANA LIMNOCHARIS Gravenhorst

To the synonymy as given in Herpetology of Japan, 1907, p. 127, add:

1829. *Rana limnocharis* "Kuhl" GRAVENHORST, Delic. Mus. Zool. Vratislav., fasc. 1, p. 42 (type locality, Java; type in Mus. Breslau; Kuhl, collector).—WIEGMANN, Nova Acta Acad. Leop. Carol., vol. 17, pt. 1, p. 255 (Java).—BOETTGER, Kat. Batr. Mus. Senckenberg., 1892, p. 3 (Hongkong; Shanghai; Canton; Hankow); Ber. Senckenberg. Naturf. Ges., 1894, p. 137 (Hongkong); p. 138 (Hankow); p. 144 (Shanghai).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, pp. 358, 308 (Shanghai; Hankow).—WOLTERSTORFF, Abh. Mus. Magdeburg, vol. 1,

1906, p. 130 (Kowloon, near Hongkong; Foochow; Pingsiang, Kiangsi; Nimrod Sound, Chekiang; Kiukiang; Nanking; Tsingtao, Shantung).—BOULENGER, Vert. Malay Penins., Rept. Batr., 1912, p. 236 (India, China, Japan, Malay Pen. and Archip.); Rec. Indian Mus., vol. 20, 1920, p. 28 (eastern Asia).—ANNANDALE, Mem. Asiat. Soc. Bengal, vol. 6, 1917, p. 132 (China, Borneo, Java).—GEE, Journ. N. China Asiat. Soc., vol. 50, 1919, p. 184 (Soochow).

*Rana gracilis* STEINDACHNER, Reise Novara, Zool., vol. 1, Amph., 1862, p. 18 (Shanghai, Hongkong).—GUENTHER, Ann. Mus. Zool. St. Pétersbourg, vol. 1, 1896, p. 206 (Yachow, Szechwan).

In his Monograph, 1920 (pp. 28 and 29), Boulenger has pointed out two errors in my treatment of this species in the Herpetology of Japan, to which I plead guilty. The first is in regard to its relationship to *R. tigerina*, which I had questioned. The second relates to a slip—to me utterly unexplainable—in the description of the female from Japan, about which I said (p. 128) that the tibio-tarsal articulations "only touch without overlapping." I have re-examined the specimen (U. S. Nat. Mus. No. 31798) and find that the heels "overlap considerably." This is also correctly stated in the "Key," as pointed out by Boulenger. Holders of the "Herpetology" are requested to make the correction in their copy.

The National Museum has now splendid series of this species, both from Java, the type-locality, and from China and Japan. It shows a surprising individual variability, and I have been unable to find any tangible differences which would justify splitting up our material into geographical groups. L. I. Moffett has sent us specimens (Nos. 52573–5, 52583, 52587) from Kiangyin, Kiangsu; Prof. C. Ping (No. 66847) from Nanking; E. Deschamps (Nos. 31724–56) and Sowerby from Shanghai (Nos. 65229–35, 65247, 66355–76). The latter also collected it at Hangchow, Chekiang (No. 66464) and found it numerous in Fukien, at Foochow (Nos. 65310–26, 66429), at Futsing (Nos. 65259–65), near Yenping (Nos. 65271–88), and even in the upper Min Basin (Nos. 64880–3). Graham collected a fine lot at Suifu (Nos. 65813–4, 65923, 65928–30, 65938–40), and also three specimens from Mount Omei (Nos. 64424 and 65812, Shin-Kai-Si, altitude 4,400 feet) and a large female (No. 65468), total length 48 mm., thus corroborating Potanin's find of this frog at Yachow in 1894.

#### RANA RUGULOSA Wiegmann

1835. *Rana rugulosa* WIEGMANN, Nova Acta Acad. Leop. Carol., vol. 17, pt. 1, p. 258, pl. 21, fig. 2 (type locality, Cape Syng-more, China; type, No. 3721, Berlin Mus.; Meyen, collector).—FITZINGER, Sitz. Ber. Akad. Wiss. Wien, Math. Nat. Kl., vol. 42, 1861, p. 414 (Shanghai, Hongkong).—PETERS, Mon. Ber. Akad. Wiss. Berlin, 1863, p. 78 (type).—ANNANDALE, Mem. Asiat. Soc. Bengal, vol. 6, 1917, p. 126 (Burma, Siam, South China, Formosa); Rec. Indian Mus., vol. 15, April, 1918, p. 60 (Burma, Siam, China).

1835. *Rana vittigera* WIEGMANN, Nova Acta Acad. Leop. Carol., vol. 17, pt. 1, p. 255 (part: specimens from Macao, China, Berlin Mus. No. 3270).

1856. *Rana rugosa* LICHTENSTEIN and MARTENS, Nomencl. Amph. Mus. Berol., p. 38 (China) (not of Schlegel).

1860. *Rana tigrina* HALLOWELL, Proc. Acad. Nat. Sci. Philadelphia, 1860, p. 504 (Hongkong) (not of Daudin).—STEINDACHNER, Reise Novara, Zool., vol. 1, Amph., 1862, p. 17 (part: Hongkong).—BOULENGER, Cat. Batr. Sal. Brit. Mus., 1882, p. 26 (part: Shanghai, Ningpo; Formosa).—BOETTGER, Offenbach. Ver. Naturk., 24–25 Ber., 1885, p. 130 (Canton); Kat. Batr. Mus. Senckenberg. Naturf. Ges., 1894, p. 137 (Hongkong).—PARENTI and PICAGLIA, Atti Soc. Natur. Modena, Mem. (3), vol. 5, 1886, p. 90 (Hongkong market).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 358 (Shanghai).—WOLTERSTORFF, Abh. Mus. Magdeburg, vol. 1, 1906, p. 130 (Pingshang, Kiangsi; Canton; Kiukiang; Shanghai).—GEE, Journ. N. China Asiat. Soc., vol. 50, 1919, p. 184 (Soochow).

1861. *Hydrostentor pantherinus* FITZINGER, Sitz. Ber. Akad. Wiss. Wien, Math. Nat. Kl., vol. 42, p. 414 (nomen nudum).

1862. *Rana tigrina*, var. *pantherina* STEINDACHNER, Reise Novara, Zool., vol. 1, Amph., pl. 1, figs. 14–17 (Hongkong).—BOULENGER, Rec. Indian Mus., vol. 20, 1920, p. 21 (Burma, Siam, French Indo-China, China, and Formosa).

1907. *Rana tigerina* STEJNEGER, Herp. Japan, Bull. U. S. Nat. Mus. No. 58, p. 139 (part: Hongkong; Formosa); Proc. U. S. Nat. Mus., vol. 38, 1910, p. 96 (Formosa).—BARBOUR, Mem. Mus. Comp. Zoöl., vol. 40, No. 4, 1912, p. 128 (Ichang, Hupeh).

1910. *Rana burkilli* ANNANDALE, Rec. Indian Mus., vol. 5 (p. 79) (type-locality, Tavoy, Tenasserim; type, in Calcutta Mus.).

1918. *Rana tigrina*, var. *burkilli* BOULENGER, Rec. Indian Mus., vol. 15, April, 1918, p. 58 (Burma, Siam, China).

Thanks to the painstaking investigations of Annandale and Boulenger, the several species or subspecies clustering around the old *Rana tigerina*, their geographical distribution and nomenclature, have now been fairly well cleared up. The synonymy of the form occurring in China has therefore been rewritten as above and should supersede that of the Herpetology of Japan (p. 139).

In addition to the old specimens from Hongkong, the National Museum now possesses the following from the Chinese mainland: Nos. 46616, from Shanghai, collected by D. C. Jansen; three from Shanghai (Nos. 66348–50); 33 from Foochow, Fukien, by Sowerby (Nos. 65334–6; 66377–85; 66406–26); and one from Wenchow, Chekiang, by Prof. C. Ping (No. 66846).

#### Genus POLYPEDATES Tschudi

The name *Rhacophorus* has recently been resuscitated for this genus on the strength of a passage in a letter by Kuhl and van Hasselt, in the *Algemeene Konst- en Letter-Bode* (Haarlem) 1822, pt. 1, p. 104. This, however, is the original of the reference in German translation<sup>22</sup> to which I called attention in the Herpetology

<sup>22</sup> Isis, 1822, p. 476.

of Japan, 1907 (p. 144), and alters in no way the fact that the two species mentioned are absolute *nomina nuda* and that the character mentioned fitted no other "Hyla" then known than *Hyla palmata* Daudin. The first reference of the generic name *Rhacophorus* by Schlegel, in 1827, to any described species, as well as the subsequent action of Wagler<sup>23</sup> and van der Hoeven<sup>24</sup> undoubtedly ties the name to *H. palmata* as a synonym of *Hyla*. The first species belonging to this genus, as now understood, was not given a nomenclatorial status until after 1838.

#### POLYPEDATES LEUCOMYSTAX MEGACEPHALUS (Hallowell)

1858. *Polypedates maculatus* GÜNTHER, Cat. Batr. Sal. Brit. Mus., p. 78 (part: Hongkong, China; not of Gray).—MUELLER, Verh. Naturf. Ges. Basel, vol. 6, pt. 4, 1878, p. 585 (Lilong and Fumun, Kwantung).—*Rhacophorus maculatus* BOULENGER, Cat. Batr. Sal. Brit. Mus., 1882, p. 83 (part).—BOETTGER, Offenbach. Ver. Naturk., 24–25 Ber., 1885, p. 131 (Swatow); 26–28 Ber., 1888 (pp. 97, 160).

1860. *Polypedates megacephalus* HALLOWELL, Proc. Acad. Nat. Sci. Philadelphia, 1860, p. 507 (type-locality, Hongkong, China).

1878. *Polypedates maculatus*, var. *unicolor* MUELLER, Verh. Naturf. Ges. Basel, vol. 6, pt. 4, 1878, p. 585 (type-locality, China; type in Basel Mus.).

1889. *Rhacophorus leucomystax* BOULENGER, Proc. Zool. Soc. London, 1889, p. 29 (part; not of Gravenhorst); 1899, p. 169 (Kuatun, Fukien).—BOETTGER, Kat. Batr. Mus. Senckenberg., 1894, p. 137 (Hongkong).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 369.—WOLSTERSTOREFF, Abh. Mus. Magdeburg, vol. 1, 1906, p. 125 (Kowlung Mt., Hongkong); p. 126 (Canton).—VOGT, Sitz. Ber. Ges. Naturf. Freunde, Berlin, 1914, p. 101 (Kwantung).—GEE, Journ. N. China Asiat. Soc., vol. 50, 1919 (p. 148) (Soochow).—*Polypedates leucomystax* STEJNEGER, Herpet. Japan, Bull. U. S. Nat. Mus., No. 58, 1907, p. 157 (Formosa).—VAN DENBURGH, Proc. California Acad. Sci., ser. 4, vol. 3, Dec. 16, 1912, p. 206 (Formosa).

1911. *Rhacophorus braueri* VOGT, Sitz. Ber. Ges. Naturf. Freunde, Berlin, 1911, p. 180 (type-locality, Formosa; type in Berlin Mus.).

A single specimen, collected by Sowerby at Foochow (No. 66405) is so darkened and shriveled that nothing much can be said about its identity, except that it belongs to *P. leucomystax* in the wider sense. One color feature can be made out distinctly, namely the coarse dark reticulation on the posterior aspect of the whitish femur remarked upon by Boulenger<sup>25</sup> as present in the other Fukien specimen and also noticed by Boettger<sup>26</sup> on a specimen from Swatow and by Van Denbrugh in Formosan specimens.<sup>27</sup> In combination

<sup>23</sup> Syst. Amph., 1830, p. 200 and Isis, 1833.

<sup>24</sup> Handb. Dierk., vol. 2, pt. 2, 1833, p. 311.

<sup>25</sup> Proc. Zool. Soc. London, 1889, p. 169.

<sup>26</sup> Offenbach. Ver. Naturk., 24–25 Ber., 1885, p. 131.

<sup>27</sup> Proc. California Acad. Sci., ser. 4, vol. 3, Dec. 16, 1912, p. 206.

with the peculiarity of the Chinese specimens that the skin is not involved in the cranial ossification, it may indicate a recognizable form deserving of a separate name for which Hallowell's *megacephalus* is available. In this connection I may call attention to Vogt's *Rhacophorus braueri*<sup>28</sup> from Formosa, which evidently belongs to this group. The National Museum possesses a specimen from Kosempo, Formosa, which in every particular fits Vogt's description. This I cannot separate structurally from Sowerby's Fukien specimen, and the reticulation on the hind part of the femur is identical. Vogt has since (1914) recognized *R. braueri* as belonging to *R. leucomystax*.<sup>29</sup>

## DIMENSIONS

	mm.
Tip of snout to vent-----	42
Width of head-----	15
Interorbital space-----	5.5
Upper eyelid-----	3.5?
Distance from nostril to eye-----	4.5
Diameter of eye-----	4.5?
Diameter of tympanum-----	3
Width of largest finger disk-----	1.5?
Fore leg-----	26
Hind leg, vent to tip of longest toe-----	68
Tibia-----	22

POLYPEDATES DENNYSI<sup>30</sup> (Blanford)

1881. *Rhacophorus dennysi* BLANFORD, Proc. Zool. Soc. London, 1881, p. 224, pl. 21, figs. 3-3a (type locality, China; type in Raffles Mus., Singapore).—BOETTGER, Offenbach. Ver. Naturk., 24-25 Ber., 1885, p. 161 (China).

1882. *Rhacophorus dennysii* BOULENGER, Cat. Batr. Sal. Brit. Mus., p. 87 (China?); Proc. Zool. Soc. London, 1899, p. 169 (Foochow and Kuatun, Fukien).—VOGT, Sitz. Ber. Ges. Naturf. Freunde, Berlin, 1914, p. 101 (Kwantung).—WOLTERSTORFF, Abh. Mus. Magdeburg, vol. 1, 1906, p. 126 (Pingsiang, Kiang-si).

Both Mr. Sowerby and Prof. Claude R. Kellogg have sent us this gigantic and handsome frog from Fukien. Sowerby's series (Nos. 65197-215, 65268-70) are from near Yenpingfu, while Kellogg's was taken "within 200 miles of Foochow."

## POLYPEDATES OMEIMONTIS Stejneger

1924. *Polypedates omeimontis* STEJNEGER, Occ. Pap. Boston Soc. Nat. Hist., vol. 5, July 21, 1924, p. 120 (type-locality, Shin-Kai-Si, Mt. Omei, Szeshwan; type U.S.N.M. No. 66548; Rev. D. C. Graham, collector).

*Diagnosis*.—Fingers half-webbed; head without spines; no cutaneous folds along legs; no dermal flap at heel; vomerine teeth in

<sup>28</sup> Sitz. Ber. Ges. Naturf. Freunde, Berlin, 1911, p. 180.

<sup>29</sup> Idem, 1914, p. 101.

<sup>30</sup> Named for Dr. N. B. Dennis who discovered the type specimen alive at a Chinese merchant's house in Singapore. When it died it was presented to the Raffles Museum. It was said to have originally come from China.

two slightly oblique series between the choanae; tympanum distinct, more than half the width of eye; upper and lower surfaces, except of hands and feet, granular; interorbital space slightly broader than upper eyelid; largest digital disk nearly as large as tympanum; tibio-tarsal joint reaching posterior angle of eye.

*Description of type specimen.*—Vomerine teeth in two slightly oblique series between and close to the choanae, each longer than the distance between them; profile of snout abruptly declivous, almost angular, from the nostrils; canthus rostralis sharp overhanging the concave loreal region as a ridge; nostrils prominent, slightly nearer the eye than the tip of the snout; interorbital space wider than upper eyelid; tympanum smooth, almost circular, about two-thirds the diameter of the eye; fingers with well-developed dermal edges, webbed one-half between third and fourth fingers, the web reaching almost to the penultimate joints of both; between second and third about one-third, reaching penultimate joint of second, but only basal joint of third; between first and second only at the base; disks of fingers very large, that of third finger nearly as large as tympanum, that of first finger but slightly wider than finger itself; first finger much shorter than and hardly reaching the middle of the penultimate joint of the second; toes more than two-thirds webbed, the web reaching the tip of the three inner toes; fifth toes longer than third by about half the diameter of the disk; disks of toes scarcely two-thirds the diameter of the finger disks; subarticular articulations moderately prominent; inner metatarsal tubercle small, flat, no outer metatarsal tubercle; tibio-tarsal joints reach posterior angle of eye and meet without overlapping when hind legs are placed vertical to the axis of the body; a sharp, narrow dermal fold from eye over tympanum to shoulder; skin above and below, except hands and feet densely granulated, the granules rather roughly tubercular on the upper surfaces, rounded underneath.

*Color (in alcohol):* Above purplish brown with indistinct and irregular dusky markings and indication of cross bars on the legs; underside whitish with small blackish spots on inner sides of arms, thigh, tibia, and hind feet; sides whitish with blackish spots and marblings which become coarser and more distinct posteriorly; lips with indistinct dusky spots; at the base of the upper surface of first and second fingers a very distinct white spot.

#### DIMENSIONS

	<i>m.m.</i>
Tip of snout to vent-----	63
Width of head-----	21
Tip of snout to nostril-----	5.55
Nostril to eye-----	5
Interorbital space-----	7

	mm.
Upper eyelid	6
Diameter of eye	7
Diameter of tympanum	4.5
Diameter of largest finger disk	4.3
Fore leg	44
Hind leg, vent to tip of longest toe	95
Tibia	30

### Genus OXYDOZYGA Tschudi

1838. *Oxyglossus* TSCHUDI, Mém. Soc. Sci. Nat. Neuchâtel, vol. 2, p. 85 (monotype, *O. lima* TSCHUDI) (not of Swainson, 1828).

1838. *Oxydozyga* "KUHL" in "TSCHUDI, Mém. Soc. Sci. Nat. Neuchâtel, vol. 2, p. 85 (in synonymy of *Oxyglossus*; type *O. lima*).

1867. *Phryngoglossus* PETERS, Mon. Ber. Berlin Akad. Wiss., 1867, p. 29 (type *P. martensii* PETERS).

1877. *Microdiscopus* PETERS, Mon. Ber. Berlin Akad. Wiss., 1877, p. 421 (type *M. sumatranaus* PETERS).

1916. *Oxyglossis* SMITH, Journ. Nat. Hist. Soc. Siam, vol. 2, Dec. 1916, p. 172 (err. typogr.).

Unfortunately the well known genus name *Oxyglossus* of Tschudi for this genus has to give way, as it was applied by Swainson ten years earlier to a genus of birds.<sup>31</sup> However, Tschudi himself furnished a substitute name of the same date by citing Kuhl's manuscript name for the same material upon which Tschudi based his genus and species.

#### OXYDOZYGA LIMA (Gravenhorst)

1829. *Rana lima* GRAVENHORST, Delic. Mus. Vratislav., pt. 1, p. 41 (type-locality, Java; type in Mus. Leiden; Kuhl, collector).

*Oxyglossus lima* TSCHUDI, Mém. Soc. Sci. Nat. Neuchâtel, vol. 2, 1838, p. 85 (Java).—HALLOWELL, Proc. Acad. Nat. Sci. Philadelphia, 1860, p. 506 (Hongkong).—GUENTHER, Rept. Brit. India, 1864, p. 401 (China, Java, Siam, Cambodia).—BOULENGER, Cat. Batr. Sal. Brit. Mus., 1882, p. 5 (Java to South China).—BOETTGER, Offenbach. Ver. Naturk., 24–25 Ber., 1885, p. 158 (Prov. Canton); Ber. Senckenberg. Naturf. Ges., 1887–88, p. —; Kat. Batr. Mus. Senckenberg, 1892, p. 1 (Canton, Mt. Lo-fu-shan, Kwangtung).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 368.—VOGT, Sitz. Ber. Ges. Naturf. Freunde, Berlin, 1914, p. 100 (Kwangtung).

1838. *Oxydozyga braccata* "KUHL" in TSCHUDI, Mém. Soc. Sci. Nat. Neuchâtel, vol. 2, p. 85 (in synonymy of *Oxyglossus lima*).

1878. *Oxyglossa lima* var. *chinensis* MUELLER, Verh. Naturf. Ges. Basel, vol. 6, pt. 4, p. 580 (nomen nudum) (Lilong, prov. Kwangtung).

A single young specimen (No. 65257) taken by Sowerby at Fusing, is the first record of this species in Fukien. Originally de-

<sup>31</sup> Zool. Journ., vol. 3, 1828, p. 356.

scribed from Java, the species extends to Bengal and southern China. Hallowell recorded it from Hongkong; Mueller from Lilong, and Boettger from Canton and Mount Lofu-shan, all in the province of Kwangtung. The National Museum has it from Canton and Hongkong. I have compared these Chinese specimens with material from Java and the Malay Peninsula in our collection and find no characters to distinguish them, a remark perhaps not superfluous in view of the fact that Mueller recorded his Lilong specimen as *O. lima* var. *chinensis*.

## Class REPTILIA

### Order LORICATA

#### Family CROCODYLIDAE

##### Genus ALLIGATOR Cuvier

1807. *Alligator* CUVIER, Ann. Mus. Hist. Nat. Paris, vol. 10, p. 25 (type, *A. lucius*=*Lacerta alligator* BLUMENBACH, part).

##### ALLIGATOR SINENSIS Fauvel

1879. *Alligator sinensis* FAUVEL, Journ. N. China Asiat. Soc., new series, vol. 13, p. 34, pl. (type locality, Wahu; type in Shanghai Mus.; J. L. E. Palm, collector).—VAILIANT, Ann. Sci. Nat., ser. 6, Zool., vol. 9, 1880, art. no. 8, p. 1 (China).—BOETTGER, Offenbach. Ver. Naturk., 24–25 Ber., 1885, p. 137 (Central China); 26–28 Ber., 1888 (p. 111); Ber. Senckenberg. Naturf. Ges., 1894, p. 142 (Wuhu, Anhwei).—BOULENGER, Cat. Chel. Brit. Mus., 1889, p. 291 (Yangtse-Kiang); Proc. Zool. Soc. London, 1890, p. 619, pls. 51–52 (Kiukiang).—GUENTHER, Ann. Mag. Nat. Hist., ser. 6, vol. 4, Sept. 1889, p. 219 (Kiukiang).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 360.—BARBOUR, Proc. Acad. Nat. Sci., Philadelphia, 1910, p. 464 (Yangtse River). Proc. New England Zoöl. Club, vol. 8, Sept. 1922, p. 32 (Wuhu).—STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 22 (Wuhu); vol. 49, 1918, p. xiv (Wuhu).—GEE, Journ. N. China Asiat. Soc., vol. 50, 1919, p. 184 (Soochow).

*Alligator sinense* MOOK, Bull. Amer. Mus. Nat. Hist., vol. 48, Dec. 7, 1923, p. 553 (lapsus) (skull).

Two skins (Nos. 52557–58), 1,320 and 1,030 meters long, respectively, have been received from L. I. Moffett. They were collected near Huchow in the province of Chekiang. Both agree closely with the beautiful figure of the head and neck of the specimen in British Museum, accompanying Boulenger's paper of 1890, except that there are three scutes on each side of the occipital series. Both have three pairs of nuchal scutes, six scutes in the fifth transversal dorsal row, and 34 caudal whorls.

## Order SQUAMATA

## Suborder SAURIA

## Family GEKKONIDAE

## GEKKO SUBPALMATUS Guenther

1864. *Gecko subpalmatus* GUENTHER, Rept. Brit. India, p. 104, pl. 12, fig. B (type locality, Chikiang, China; type in Brit. Mus.; Fortune, collector).—BOULENGER, Cat. Liz. Brit. Mus., vol. 1, 1885, p. 189 (Chikiang); Proc. Zool. Soc. London, 1899, p. 160 (Kuatun, prov. Fukien).—BOETTGER, Offenbach. Ver. Naturk., 24–25 Ber., 1885, p. 139 (Chikiang).

After a careful examination of a considerable material consisting of 49 specimens of Gekko from China, besides numerous ones from Japan, Riukiu, Tsu-shima, and Korea, I have come to the conclusion that Guenther and Boulenger were right in recognizing three different forms. The characters which separate them are very variable, and it may take a combination of two or more to decide in doubtful cases, but with one exception I have been able to place all the specimen before me to my entire satisfaction. The three forms are only geographic subspecies, it is true, and in some intermediate localities there may be more real intergradation than my material shows, but, on the other hand, I have a strong suspicion that some of the intergradation may be due to hybridization. These lizards are easily carried about accidentally in cargoes, and the enormous extent of the territory covered by the coast form, *G. japonicus*, from Hong-kong to the Gulf of Tartary, Formosa, and Japan, is probably due to such accidental dispersion. It is also significant that it is this form which occurs along the Yangtse River as far inland as Ichang at least. It can scarcely be doubted that individuals thus carried into the territory of a form so closely allied, as these geckos manifestly are, would eventually mix with it, probably resulting in specimens which obscure the diagnostic character of the subspecies.

Rev. D. C. Graham has sent five specimens of *G. subpalmatus* from Suifu. They are all practically devoid of tubercles, and the web at the base of the toes is well developed and is an easily recognized character. The size and shape of the median chin shields is not so reliable. In one old female, No. 63593, they are not differentiated at all, but in the others they are well marked though considerably smaller than in the average *G. japonicus*, and similar to those of most *G. swinhonis*.

The type locality of this form, Chikiang, is apparently also located in Szechwan, and as far as I know no specimens from outside that province have as yet been recorded, except the female collected by La Touche in 1896 at Kuatun, province Fukien, as noted by Bou-

lenger. Among Sowerby's Fukien material there is also a gecko collected by him at Foochow. As far as the web of the feet is concerned, it is a typical *G. subpalmatus*, but the back is regularly covered with small though distinct tubercles, and the median chin shields are rather well developed. As Boulenger in recording the La Touche specimen gave no details, I wrote to Miss Joan B. Procter asking her to examine it with regard to the above points. She kindly replied that the dorsal skin is uniformly granular without any of the tubercles proper to *G. japonicus*, that it also has a well-defined interdigital web and small chin shields, and is in every way the typical *G. subpalmatus*. I am therefore strongly inclined to the belief that the tubercles of the Sowerby specimen are the result of admixture of *G. japonicus* blood, especially as Foochow is a seaport, while the Kuatun locality is a considerable distance inland.

#### GEKKO SWINHONIS Guenther

For synonymy see Stejneger, Herpetology of Japan, 1907, p. 166, footnote.  
Add:

*Gecko swinhœi* WERNER, Abh. Bayer. Akad. Wiss., II Kl., 1903, p. 360  
(Tientsin).

*Gekko swinhonis* BARBOUR, Proc. New England Zoöl. Club, vol. 4, Nov. 1909, p. 61 (Sian, Shensi).—VAN DENBURGH, Proc. California Acad. Sci., ser. 4, vol. 3, Dec. 16, 1912, p. 207 (Chefu).

*Gecko japonicus* SOWERBY in Clark and Sowerby, Through Shen-Kan, 1912, p. 111 (Kansu, Shensi).

Mr. Sowerby collected five specimens at Pei-tai-ho in north-eastern Chili, on the north side of the Gulf of Pechili, during August, 1921 (Nos. 64875–79). They are perfectly typical of this form with small and few tubercles, hardly any in front of the shoulders. In some there are a few tubercles on the temples, but the amount and size of the temporal tubercles do not seem to be of any diagnostic importance. The chin shields vary to some extent, being mostly of median size, in one specimen rather large, in two rather small.

Three specimens (Nos. 39343–45) collected by him in Kansu, 20 miles west of Chingyangfu, on August 7, 1909, are likewise referable to this subspecies.

A young specimen (No. 39342) collected by him 20 days later at Ching-chien-hsien, Shensi, is somewhat dubious in its relationships. The tubercles are rather well developed and numerous on the back as well as on upper neck and on the temples, though there are none on the occiput. On the other hand, the chin shields are small, separated by a small median one, much as in extreme *G. swinhonis*. If we can discover no trace of a web. Have we here to do with an admixture of *G. japonicus* blood accounting for the great development of the tubercles? I am the more inclined to think so since Doctor Barbour, in recording five specimens from Sian, or Sigan (Hsi-ngan),

in the southern part of Shensi, of which it is the capital, states that they substantiate the characters of few dorsal tubercles and a small, separated inner pair of chin shields.

A specimen of the same age (No. 35528) which, if the label is read correctly, is from Hwo-ma-wan, Shantung, collected by Prof. E. Blackwelder on November 12, 1903 (collector's number 6016), has very few tubercles and small, separated chin shields, and is an undoubted *G. swinhonis*.

This brings up the question as to the status of the Chefu specimens. Doctor Van Denburgh refers them to *G. swinhonis*, but Boulenger, who recognized the distinction of the latter, refers a specimen in British Museum to *G. japonicus*. Have we here a case of a recent accidental introduction of the latter?

In addition to the above material the National Museum has a fine large series of 26 typical specimens of *G. swinhonis* from the country between Tien-tsin and Peking, collected by M. L. Robb (Nos. 29702–27) which illustrates beautifully the extent of the individual variation in this form.

#### **GEKKO JAPONICUS (Duméril and Bibron)**

For synonymy see Stejneger, Herpetology of Japan, 1907, pp. 165–166. Add:

*Gecko japonicus* BOULENGER, Cat. Liz. Brit. Mus., vol. 3, 1887, p. 488 (Ichang, China; Riukiu Islands).—BOETTGER, Offenbach. Ver. Naturk., 24–25 Ber., 1885, p. 139 (China); Ber. Senckenberg. Naturf. Ges., 1894, p. 143 (Shanghai).—GUENTHER, in Pratt's To Snows of Tibet, 1892, p. 239 (Mountains north of Kiukiang).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., 1903, p. 360 (China).

*Gekko japonicus* BARBOUR, Proc. New England Zoöl. Club, vol. 4, Nov., 1909, p. 61 (Kanagawa, Japan).—VAN DENBURGH, Proc. California Acad. Sci., Nov. 4, vol. 3, Dec. 16, 1912, p. 106 (Shanghai; Formosa; Riukiu Islands).

The question of the relationship of this form has been discussed above, and it has also been intimated that it may have been widely dispersed in China, including the Yangtse Valley, by human agency. The specimens sent by L. I. Moffett from Kiangyin, Kiangsu (Nos. 52561–5); by F. N. Meyer from Hankow (No. 60049); by Dr. Lewis R. Thompson from the southwestern part of Hunan (Nos. 63204–5); and by J. T. Illick from Kiangsu (No. 65093) are plainly referable to this form.

#### **HEMIDACTYLUS BOWRINGII (Gray)**

For synonymy and illustration see Herp. Japan, 1907, p. 176 to which add: VOGT, Sitz. Ber. Ges. Naturf. Freunde, Berlin, 1914, p. 79 (South China [Canton?]).

Eight specimens (Nos. 66446–53) recently received from Mr. Sowerby attest to the occurrence of this species at Foochow, Fukien, six adults and two young. The two adult males have each 15 pores on each femur.

## Family AGAMIDAE

## JAPALURA FLAVICEPS Barbour and Dunn

1896. *Japalura yunnanensis* GUENTHER, Ann. Mus. Zool. Acad. Sci. St. Pétersbourg, vol. 1, p. 203 (Riv. Tung, Szechwan) (not of Anderson).—BARBOUR, Mem. Mus. Comp. Zoöl., vol. 40, no. 4, August, 1912, p. 134 (Tung River, Szechwan).

1919. *Japalura flaviceps* BARBOUR and DUNN, Proc. New England Zoöl. Club, vol. 7, Oct. 10, 1919, p. 16 (type-locality, Shores of Tung River, western Szechwan; type, Mus. Comp. Zoöl., no. 12469; W. R. Zappey, collector).

This species which is considerably smaller and less conspicuously marked than *J. splendida* appears to be confined to the higher altitudes of western Szechwan and Yunnan. Until recently, when Barbour and Dunn separated the three species, both were confounded with *J. yunnanensis*. There is consequently doubt yet as to the pertinency of some of the older records. Thus, while there is no doubt that the *Japalura* collected by Potanin on the Tung River belongs here, as practically from the type-locality, there is no such certainty as to the specimen collected by Berezowski at Lunganfu, Szechwan, both of which were recorded by Guenther, in 1896, as *J. yunnanensis*. This doubt is now set at rest by the receipt of a splendid series collected by Mr. Graham at Mowchow at an altitude of 5000 feet (Nos. 67820–7) and at Wan-chow (Nos. 67776–7).

Rev. D. C. Graham collected eleven good specimens representing both sexes and young on his trip to Tatsienlu, consequently not far from the type locality. Six (Nos. 66536–41) were from within 30–40 miles of Tatsienlu, and five (Nos. 66637–41) from Lu-ding-chiao on the Tung River, all at altitudes ranging between 4,500 and 6,000 feet.

## JAPALURA SPLENDIDA Barbour and Dunn

1870. *Japalura swinhonis* SWINHOE, Proc. Zool. Soc. London, 1870, p. 411 (Chunkingfu, Szechwan) (not *J. swinhonis* GUENTHER).

1885. *Japalura yunnanensis* BOULENGER, Cat. Liz. Brit. Mus., vol. 1, p. 310 (Szechwan) (not of Anderson).—GUENTHER, Ann. Mag. Nat. Hist. (ser. 6), vol. 4, 1889, p. 218 (*yunnanensis*, err. typ.) (Ichang); in Pratt's To Snows of Tibet, 1892, p. 239 (Ichang).—STEJNEGER, Herp. Japan, p. 187 (Chinling Mountains, Shensi).

1919. *Japalura splendida* BARBOUR and DUNN, Proc. New England Zoöl. Club, vol. 7, Oct. 10, 1919, p. 18 (type locality, Gorge of the Yangtse River near Ichang, Hupeh; type, U. S. Nat. Mus. No. 35522; E. Blackwelder, collector).

In addition to the material upon which Barbour and Dunn founded the species, namely, the type No. 35522, from the gorge of the Yangtse near Ichang, the paratypes No. 35523, from near Taininghsien at the eastern end of the Chihsiting Pass, eastern Szechwan near the Hupeh border, and No. 35524 from Liang-ho, Chinling Mountains, southern Shensi, all collected by Prof. E. Blackwelder in 1904, the Museum has now a fine series of six elegant

specimens (Nos. 65461–6) collected by Rev. D. C. Graham near Mount Wa, Szechwan. The largest is as large as the type, even more brightly colored and with a much higher and better developed nuchal crest, which in the original description of the type is characterized as "very feeble."

### Genus PHOXOPHRYS Hubrecht

1881. *Phoxophrys* HUBRECHT, Notes Leyden Mus., vol. 3 (p. 51) (monotype *Ph. tuberculata* HUBRECHT).

#### PHOXOPHRYS GRAHAMII Stejneger

1924. *Phoxophrys grahami* STEJNEGER, Occ. Pap. Boston. Soc. Nat. Hist., vol. 5, July 21, 1924, p. 120 (type-locality, Suifu, Szechwan, China; type, U.S.N.M. No. 65500; Rev. D. C. Graham, collector).

*Diagnosis.*—All scales keeled; anterior superciliaries not enlarged into horn-like appendages; supralabials eight; flanks with numerous large scales equal to the largest on the back.

*Description of type.*—Adult: Rostral low, about four times as wide as high, separated from nasal by one scale; nostril circular, with a swollen rim, in the posterior part of a rather large, oblong scale which is situated below the rostral canthus and in contact with first supralabial; canthus rostralis very sharp, covered with small angular scales forming a ridge continuous with a high superciliary crest, the last two scales of which are enlarged and angularly compressed, above and behind center of eye; top of head, including supraoculars, covered with uncarinate, more or less wrinkled scale of varying size; snout and interorbital space deeply concave, the latter covered with one or two scales between the supraorbital semicircles which end in one or two large pointed, keeled, and wrinkled tubercles back of the eye, separated from the last large superciliary by two or three minute scales forming a gap in the superciliary crest; on either side of the small occipital a larger polygonal shield with a high central ribbed tubercle, which with the postorbital supraocular tubercle form a nearly continuous transverse ridge; temples covered with polygonal, tuberculated scales, one group of large tubercles on the postocular semicircle and the other above the tympanic cavity which is covered with minute scales; eight narrow, elongated upper labials and seven lower ones; dorsal surface covered with small, uncarinate scales intermixed with larger scales and tubercles; a low median crest of about six enlarged, compressed, keeled scales on anterior part of upper neck, the third from the occiput being the highest; on either side several groups of enlarged scales and tubercles; no median dorsal or caudal series of enlarged scales; from the shoulders backward a median dorsal zone of small, but fairly uniformly sized, narrow, sharply keeled, imbricate scales, about six in a transversal row between a longitudinal series of en-

larged keeled scales which converge and meet at the base of the tail; lateral scales very heterogeneous, the larger tuberculated ones usually forming transverse rows, the ones at the insertion of the legs very minute, almost granular as are those in the bottom of the fold on the side of the neck; leg scales of varying size, all sharply keeled, the larger ones grouped in a patch each on upper and lower arms, thighs and femurs, the largest ones on the hind legs forming pointed tubercles larger than any on the back; scales on underside all pointed, sharply unicarinate, except under digits which are pluricarinate; tail scales fairly homogeneous, unicarinate, pointed above, a few enlarged ones above at the base. Color (in alcohol) above brownish gray with large ill-defined dusky cross patches on occiput and back separated by narrow pale cross bars equally ill-defined; a broad pale band, narrowly edged with black, across

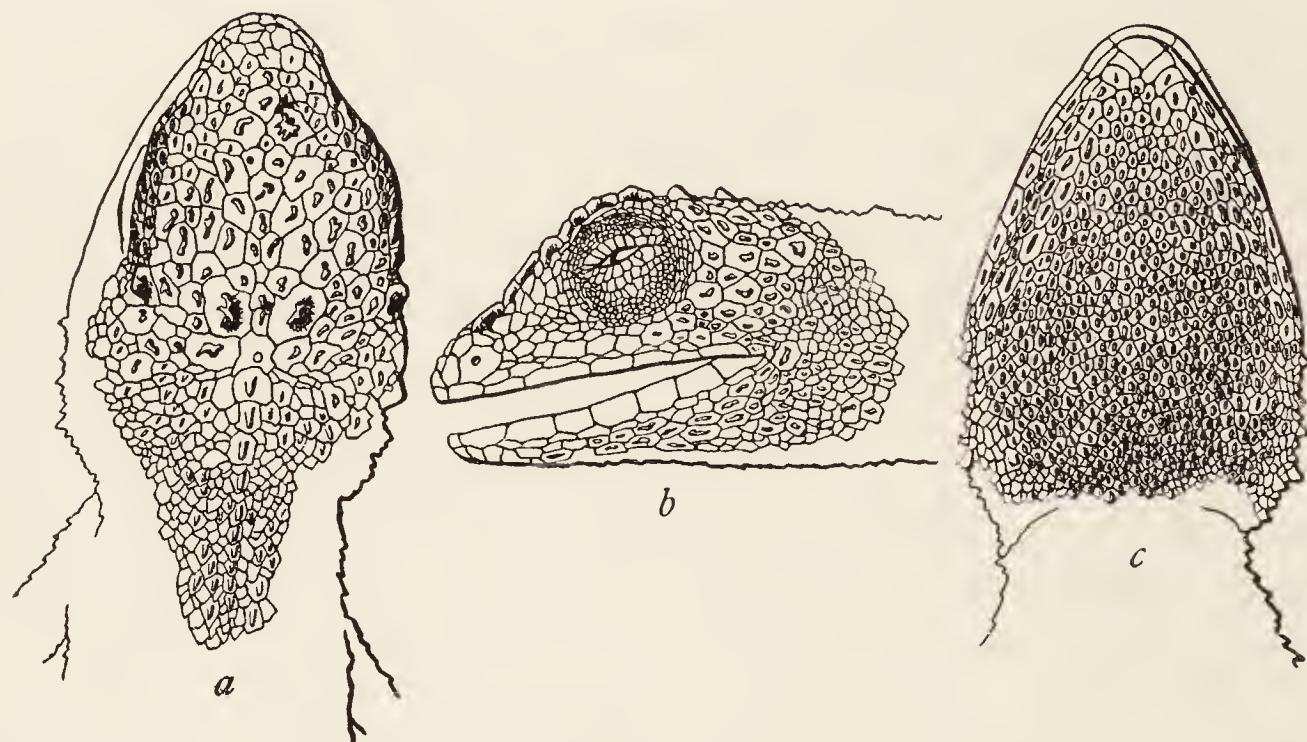


FIG. 1.—*PHOXOPHRYS GRAHAMI*. TYPE. U. S. NAT. MUS. No. 65500. 2 X NAT. SIZE.

forehead and supraoculars, preceded by a dark brown triangular mark which cuts angularly into the pale band; a dark brown band from orbit to angle of mouth and base of lower jaw, preceded by a pale band; lower jaw with alternating bands of pale and brown; legs and tail cross banded with dusky; a whitish, black-edged spot on each knee; underside pale gray speckled with dusky on throat.

	DIMENSIONS	mm.
Total length		134
Snout to vent		51
Vent to tip of tail		83
Snout to center of eye		8.5
Greatest width of head		12
Fore leg		24
Hind leg		35

*Remarks.*—The genus *Phoxophrys* was based by Doctor Hubrecht<sup>32</sup> upon a single specimen collected in Sumatra, which he named

<sup>32</sup> Notes Leyden Mus., vol. 3, 1881, p. 51.

*Ph. tuberculata*. Up to the present time this is the only specimen known in any museum. It is, therefore, a great surprise to find another specimen, evidently closely allied, in the Graham collection from Suifu. From Hubrecht's rather brief description, slightly altered and added to by Dr. Nelly de Rooij,<sup>33</sup> it is not easy to point out any radical difference between the two species, but with the aid of the figures given of *Ph. tuberculata* it seems certain that the Chinese species differs from the Sumatran one in lacking the anterior supraciliary "horns," in much larger and more numerous enlarged scales and tubercles on the flanks, and fewer supralabials. In the diagnosis of the genus the body is said to be covered with small smooth scales. In *Ph. grahami* all are keeled. The descriptions of *Ph. tuberculata* do not mention any nuchal median crest of enlarged tubercles, nor is one shown on the first figure given of the species,<sup>34</sup> but the figure given by Miss de Rooij<sup>35</sup> seems to indicate that one is present. On the whole, the Graham specimen appears to be much more tuberculated and spiny than the one from Sumatra. In the latter the larger tubercles and scales are described as "multicarinate," by which I suppose the subsidiary wrinkles and ridges are meant which appear when the central keel is transformed into a more or less perfect conical tubercle. All the scales of *Ph. grahami* are unicarinate, except those on the underside of the digits which are distinctly pluricarinate.

This genus seems to be rather closely related to *Japalura*, the chief difference being the presence of a dorsal crest in the latter. The finding of a *Phoxophrys* in China therefore is perhaps not so remarkable, indicating as it does, that the two genera have a somewhat similar geographic distribution.

#### Genus PHRYNOCEPHALUS Kaup

- 1826. *Phrynocephalus* KAUP, Isis, 1825, p. 591 (type design. by Fitzinger, 1843, *Ph. caudivolvulus*).
- 1831. *Megalochilus* EICHWALD, Zool. Special., vol. 3 (p. 185) (*M. auritus*).
- 1841. *Megalophilus* BONAPARTE, Icon. Fauna Ital., vol. 2, Introd., p. 1 (err. typogr.).
- 1843. *Saccostoma* FITZINGER, Syst. Rept., p. 18 (type, *Phrynocephalus auritus*).
- 1843. *Helioscopus* FITZINGER, Syst. Rept., p. 18 (type, *Phrynocephalus helioscopus*).
- 1843. *Phrynosaurus* FITZINGER, Syst. Rept., p. 18 (type, *Phrynocephalus olivieri*).

The genus *Phrynocephalus* in which Boulenger, when publishing the first volume of the Catalogue of Lizards in the British Museum (1885), enumerated 16 species, is now considered by the latest Rus-

<sup>33</sup> Rept. Indo-Austral. Archip., vol. 1, 1915, p. 94.

<sup>34</sup> Hubrecht, in Veth's Midden Sumatra, Sect. 4, Naturl. Hist., vol. 1, 1887, Rept., pl. fig. 3.

<sup>35</sup> Rept. Indo-Austral. Archip., vol. 1, 1915, fig. 48, p. 95.

sian herpetologists as containing more than three times as many species and subspecies. Thus Bedriaga, who in 1907–1909 published an elaborate account which amounts to a monograph of the genus, after an examination of about 1,350 specimens<sup>36</sup> recognized 44 species and numerous subspecies. The genus, which in many ways shows analogies with the American Iguanoid genus *Phrynosoma*, is confined to the Asiatic desert regions, from the Caspian Sea in the west almost to the Pacific Ocean in the east. Only recently Mr. Sowerby has confirmed its occurrence in China proper, though it has been known for many years from the adjacent Mongolian provinces, where numerous forms have been discovered by Russian explorers, such as Przhevalski, Potanin, and others.

A single *Phrynocephalus* collected during the expedition of Count Bela Szechenyi at "Quan-joan-shin (Kwang-yuen)" in the province of Szechwan, was identified and recorded by Steindachner as *Phrynocephalus caudivolvulus*,<sup>37</sup> the first record of a *Phrynocephalus* from within the boundaries of China proper. That it is not *Ph. caudivolvulus*, as at present restricted and understood, is certain, but only a reexamination of the specimen can decide to which of the many related forms it belongs.

#### PHRYNOCEPHALUS POTANINI Bedriaga

1907. *Phrynocephalus potanini* BEDRIAGA, Wiss. Res. Przewalski Central-Asien Reis., Zool., vol. 3, sect. 1, Amph. Rept., pt. 2, Nov. 9, 1907, p. 144; pt. 3, June 20, 1909, p. 389, pl. 6, figs. 7–7b (type locality, Hwangho and Ulan-Muren River, Ordos, China; types, Nos. 7443 and 7438 Mus. St. Petersburg; Potanin, collector).

1912. *Phrynocephalus frontalis* SOWERBY, in Clark and Sowerby, Through Shen-Kan, 1912, p. 111 (Yulinfu, Shensi) (not of Strauch).

With the material at hand there is no difficulty in recognizing that the two series, collected by Sowerby in two provinces, represent two different forms, though undeniably they are closely allied and belong to the *Ph. caudivolvulus* group. On direct comparison it is plain that in one the nostrils are relatively closer together than in the other; one also has a higher head, and possibly the outline of the snout is somewhat different. One has slightly larger scales than the other, but when reduced to actual measurements the figures run together. This does not mean that the two forms are connected by "intermediates." Viewed together, as groups or individually, the observer has no difficulty in distinguishing them. In this particular instance it so happens that the species with the narrow internarial space has the larger dorsal scales, and it is thus possible to separate the two series

<sup>36</sup> Wiss. Result. Przewalski Central-Asien Reis., Zool., vol. 3, Sect. 1, Amph. Rept., pt. 2, 1907, and pt. 3, 1909, pp. 134–500, pls. 3–7 and 9.

<sup>37</sup> Wiss. Ergebn. Reise Szechenyi Ost-Asien, vol. 2, 1898, p. 505; Hungarian Edition, 1897, p. 651.

by the contrast of the characters in combination, but that is of but scant help in determining their relation to, or identity with, other named forms known only from descriptions.

The recognition of the various forms of *Phrynocephalus* belonging to the *Ph. caudivolvulus* group is exceedingly difficult from descriptions, no matter how accurate these are, and especially perhaps when they are so elaborate and detailed as Bedriaga's. I am not questioning the validity of the various forms described, but without authentically identified material from type localities for comparison one can hardly ever be sure of the identifications. The trouble is not only that these lizards are subject to endless individual variation, but the nature of their lepidosis is such that it leaves very few definite points for measurements, so that some of the proportions to which the describers have had to resort for key characters are so vague that they give different results every time they are applied. Thus the distance from tip of snout to preocular fold is so elusive that it is hopeless to use it in connection with the internarial distance which has to be expressed in fractions of a millimeter. The "height" of the head is another uncertain character, and the distance from tip of snout to gular fold. The figures can not by any possibility be exact enough to be applicable to material of different provenience and preservation. And so with most of the characters employed, such as the carination, sharp or slight, and smoothness of the dorsal scales, the homogeneousness or heterogeneousness of the dorsal lepidosis, etc.

A careful and, let me add, laborious study of Bedriaga's monograph has convinced me that the series (U. S. Nat. Mus. Nos. 39319–25) of Phrynosomas collected by Sowerby on November 9, 1908, at Yulinfu, altitude 4,000 feet, are not true *Ph. frontalis*, but *Ph. potanini*. Bedriaga's series of nine specimens, collected by Potanin at two localities in Ordos, from which Yulin is not very distant, shows a great deal of variation, the description of which covers the variations shown by Sowerby's series of seven specimens, so that I shall not add to the accumulation of details already on record. This species differs from true *Ph. frontalis* chiefly in the lower head, wider internarial space, smaller dorsal scales, and, as said before, with specimens of both species before one there is no difficulty in distinguishing them.

Mr. Sowerby has given a very interesting account of this species in life, from which I quote, as follows:

I have not met this little lizard anywhere but in, and on the border of, the Ordos Desert. Here it may be seen in great numbers during the warmer months of the year. These little creatures are very pugnacious, and indulge in desperate battles with one another. They have a peculiar habit of rapidly

curling and uncurling their tails over their backs. This action looks very venomous, and is strongly suggestive of the vicious swishing of the scorpion's deadly caudal weapon. This lizard is of a general sandy colour above, with creamy underparts. Blotches of a darker shade occur over the body, and extending along the tail grow darker, finally ending in a series of black rings. The last half inch of the tail is black. The under surface of the tail is pale vermillion, while a crimson-mauve patch occurs behind each fore limb. The head is shaped like that of a toad, the eyes being black with white eyelids. It makes holes in the sand in which it shelters at night, or when threatened with danger.

#### PHRYNOCEPHALUS FRONTALIS Strauch

1876. *Phrynocephalus frontalis* STRAUCH, Opis. Presm. Zemnov. Eksped. Przhevalskago, p. 15, pl. 3, fig. 1 (type-locality, Ordos, Mongolia; types in Mus. St. Petersburg, Nos. 3920–21; Col. Przhevalski, collector).—BOULENGER, Cat. Liz. Brit. Mus., vol. 1, 1885, p. 375 (Ordos, Mongolia).—BOETTGER, Offenbach. Ver. Naturk., 24–25 Ber., 1885, p. 141 (Ordos).—?MEHÉLY in Zichy's Dritte Asiat. Forschungsreise, vol. 2, 1901, Zool., p. 47, pl. 6, figs. 3, 5, 7, 8 (Mongolia).—ELPATJEWSKI, Trudi Troitsko-Savsk. Otd. Geogr. Obshtch., vol. 9, 1906 (p. 57) (Transbaikalia).—BEDRIAGA, Wiss. Res. Przewalski Central-Asien Reis., Zool., vol. 3, sect. 1, Amph. Rept., pt. 3, 1909, p. 404, pl. 9, figs. 7–7a (Ordos).—NIKOLSKI, Fauna Rossij, Rept., vol. 1, 1915, p. 217 (Ordos).

1897.? *Phrynocephalus caudivolvulus* STEINDACHNER, in Wiss. Szechnyi's Kelet-Azsiai Utjanak Tudomán. Ered., vol. 2, (p. 651) (Kuan-Jaön-szhien. China), Szechenyi's Wiss. Ergebn. Reise Ost-Asien, vol. 2, 1898, p. 505.

During May 1912 Mr. Sowerby collected another interesting series (U. S. Nat. Mus. Nos. 49645–52) of *Phrynocephalus* on the plain about 30 miles southeast of Kuei-hua-cheng, in northern Shansi. They agree fairly well with the original description and with Bedriaga's very detailed reexamination of the six cotypes from Ordos (no locality specified), including his minute description of their individual peculiarities, to which I can add nothing. With regard to Mehely's detailed enlarged drawings of the scutellation surrounding the pineal shield and the nostrils (by the way the only serviceable figures among the numerous illustrations of species of this genus) I can only say that the former does not agree with any of Sowerby's specimens, in all of which this shield is surrounded by a large number of small scales rather smaller than the dorsals, as described by Bedriaga.

#### Family SCINCIDAE

##### Genus EUMECES Wiegmann

1834. *Eumeccs* WIEGMANN, Herpet. Mexic., p. 36 (type *E. pavimentatus*, design. 1835).

1839. *Plestiodon* DUMÉRIL and BIBRON, Erpét. Gén., vol. 5, p. 697 (type, designated by Fitzinger, 1843, *Plestodon quinquelineatus*).

1843. *Plestodon* FITZINGER, Syst. Rept., p. 22 (emendation).

1843. *Pariocela* FITZINGER, Syst. Rept., p. 22 (designated type, '*Plestodon laticeps*').

1848. *Plistodon* AGASSIZ, Nomencl. Zool. Index Univers., p. 863 (emendation).

1852. *Lamprosaurus* HALLOWELL, Proc. Acad. Nat. Sci. Philadelphia, 1852, (p. 206) (type *L. guttulatus*).

It seems desirable to recount briefly the steps by which the type of this genus has been determined.

In his *Herpetologia Mexicana* (1834) Wiegmann separated a subgenus *Eumeces* from the genus *Euprepis* of Wagner (1830) and included in it three species, without designating any of them as type, namely, *E. punctatus*, *E. rufescens*, and *E. pavimentatus*. During the following year, in an article reviewing his own work,<sup>38</sup> and before anybody else designated a genotype for *Eumeces*, he expressly states that he had erroneously included in it *Scincus rufescens* Merrem and *punctatus* Schneider; "both," he says, "belong to *Euprepes* s. str., only *Sc. pavimentatus* Geoffr. belongs to *Eumeces*." In no more definite way could the latter be designated as the genotype. Nevertheless, in 1839, Duméril and Bibron<sup>39</sup> made *E. punctatus* the type and, in 1843, Fitzinger<sup>40</sup> designated *E. rufescens*, but their action, of course, does not influence the original determination at all.

#### EUMECES ELEGANS Boulenger

*Eumeces elegans* STEJNEGER, Herp. Japan, 1907, p. 202.—VAN DENBURGH, Proc. California Acad. Sci., ser. 4, vol. 3, Dec. 1912, p. 223 (Mokanshan, near Huchou, Chekiang).—VOGT, Sitz. Ber. Ges. Naturf. Freunde, Berlin, 1914, p. 100 (Canton).

1912. *Eumeces xanthi* BARBOUR, Mem. Mus. Comp. Zoöl., vol. 40, no. 4, Aug. 1912, p. 134 (Ichang) (not of Guenther, 1889).

After a careful examination of the young specimen in the Museum of Comparative Zoölogy (No. 7965) collected by W. R. Zappey at Ichang, the type locality of *Eumeces xanthi*, for the loan of which I am greatly indebted to my friend Dr. Thomas Barbour, I have come to the conclusion that it is a very young *E. elegans* and not *E. xanthi*. It matches in every respect specimens at hand of the former, in the number and size of scales; the absence of a postnasal; the absence of a second azygos postmental; the presence of one pair of nuchals only; presence of enlarged scales on the posterior aspect of the femur and of a keeled scale behind the corners of the arms; and in the coloration which is exactly as in Graham's specimen No. 64126 from Szechwan, Sowerby's from Foochow, and Illick's from Nanking. This latter, and in fact all the other specimens of *E. elegans* examined by me, except the Szechwan and the Wenchow specimens have the same postmental arrangement of scales, the two latter differing only in having a small median scale separating the first paired postmental shields which consequently are not in contact, but this ar-

<sup>38</sup> Archiv für Naturgeschichte, 1835, vol. 2, p. 288.

<sup>39</sup> Erpét. Gén., vol. 5, p. 630.

<sup>40</sup> Syst. Rept., p. 23.

rangement has nothing in common with the regular two azygous postmentals in the *E. chinensis* group. *E. xanthi*, judging from Guenther's description, belongs to a different group, with dorsal scales normally broader than the laterals and ventrals. Guenther himself compares his species, of which originally he had four specimens, with *E. skiltonianus*, from California, from which he says it is barely distinguishable "by a somewhat different coloration and by the postfrontals [i. e. prefrontals] being widely separated from each other, while they are more or less in contact in the American form," but apart from the fact that the latter character is worthless on account of its variability, I think it probable that *Eumeces xanthi* is closer to *E. quadrilineatus*, from Hongkong, from which it seems to differ chiefly in the number of scale rows, than to *E. skiltonianus*. This supposition is strongly confirmed by a sketch of the temporal shields kindly made for me by H. W. Parker from the type in British Museum, which shows these shields to be identical with those of *E. quadrilineatus*.

List of specimens of *Eumeces elegans*

United States National Museum No.	Sex and age	Locality	When collected	By whom collected	Scale rows	Dorsals	Postnasal	Postmental	Nuchals	Seales under fourth toe	Posterior loreal touching labials
					26	52	0	1	1	17	2
22301	Juvenile	Chapu near Ningpo	B. Schmacker		26	52	0	1	1	17	2
60574		Foochow, 200 miles off	C. R. Kellogg		26	50	0	1	1	17	2
64126		Suifu, Szechwan	D. C. Graham		26	52	0	1	1	19	2
66643		do	do		0	1	0	1	1	1	2
65017		Wenchow, Chekiang	Sept. 25, 1923	C. Ping	28	50	0	1	1	18	2
65094		Nanking	J. T. Illick		26	52	0	1	1	18	2
66440	Juvenile	Foochow, Fukien	A. deC. Sowerby		0	1	0	1	1	1	2
66441	do	do	C. Ping		0	1	0	1	1	1	2
66442	do	do	J. T. Illick		0	1	0	1	1	1	2
66443	do	do	do		0	1	0	1	1	1	2
66444	do	do	do		0	1	0	1	1	1	2
Wisconsin University	do	Foochow, 200 miles off	C. R. Kellogg		24	—	0	1	1	1	2
Do	Adolescent	do	do		26	—	0	1	1	1	2
M. C. Z., 7965	Juvenile	Ichang, Hupeh	W. R. Zappey		26	50	0	1	1	18	2

## EUMECES CHINENSIS (Gray)

*Eumeces chinensis* STEJNEGER, Herp. Japan, 1907, p. 208 (Formosa).—VAN DENBURGH, Proc. California Acad. Sci., ser. 4, vol. 3, Dec. 1912, p. 225 (Shanghai).—VOGT, Sitz. Ber. Ges. Naturf. Freunde, Berlin, 1914, p. 100 (Canton).

A splendid series from the province of Fukien has been sent in by Mr. Sowerby, making it possible to study the variation of this species which has been considered less common than the other Chinese skinks. There are 25 specimens (Nos. 65343–67) from near Yenpingfu, three (Nos. 65372–4) from Futsing District, and two (Nos. 66438–9) from Foochow.

The constancy of certain characters, usually relied upon in diagnosing the species of this genus, is quite surprising. Of the thirty specimens all have two unpaired postmentals; one only (No. 65356) has a postnasal, which is quite small, but distinct and symmetrical on both sides, and one (No. 66438) has a very small one on one side; seven have 26 scale rows around the middle of the body, all the others have 24; the average number of dorsal scales on the middle line between the second nuchal and a line from groin to groin,<sup>41</sup> is 45, minimum 43, maximum 47; number of scales under fourth toe averages 16.4, minimum 15, maximum 17. The nuchals show the greatest variation, though only two specimens have only one pair; five have 2 on one side and 1 on the other; four have 3 on one side and 2 on the other; seventeen have 2 on each side, so that two pairs must be considered normal. This is also indicated by the fact that twenty-seven of the thirty have two at least on one side. In one specimen (No. 66439) one nuchal in the first row and one in the second row are broken up.

All these specimens are adults, uniform brownish gray with a more yellowish head and reddish spots on sides of neck and flanks, except one (No. 65366) which is much younger, 61 mm. from tip of snout to vent; the ground color of this one is also brownish gray, but very much darker than the adults; in the center of each dorsal scale there is a dusky line, forming with the others six longitudinal equidistant stripes down the back; the space between the two outer stripes and the two central ones is slightly paler than between the others, indicating the yellow stripes of the very young; no definite pattern on the head. A somewhat older one (No. 66439), 81 mm. from snout to vent, is colored essentially as the adults, but the head is yet quite narrow. A specimen from Shanghai (No. 31720 shows no essential difference from the Fukien specimens. It is included in the table following.

<sup>41</sup> I have preferred this line to the one back of the femurs as more easily recognized and consequently more likely to be accurately established.

*List of specimens of Eumeces chinensis*

United States National Museum No.	Sex and age	Locality	When col- lected	By whom collected		Scales under fourth toe
				Scale rows	Dorsals	
65343		Near Yen-ping-lu, Fukien	A. deC. Sowerby	24	45	0
65344		do	do	26	45	0
65345		do	do	24	43	0
65346		do	do	24	45	0
65347		do	do	24	46	0
65348		do	do	24	46	0
65349		do	do	26	46	0
65350		do	do	24	45	0
65351		do	do	24	44	0
65352		do	do	26	46	0
65353		do	do	24	43	0
65354		do	do	24	46	0
65355	Male	do	do	26	47	0
65356		do	do	24	45	1
65357		do	do	24	46	0
65358		do	do	24	44	0
65359		do	do	24	46	0
65360		do	do	26	45	0
65361		do	do	24	47	0
65362		do	do	24	46	0
65363		do	do	24	45	0
65364		do	do	24	46	0
65365	Male	do	do	24	45	0
65366	Juvenile	do	do	24	46	0
65367		do	do	24	45	0
65372		Futsien District, Fukien	do	26	43	0
65373		do	do	24	43	0
65374		do	do	24	45	0
66438		Foochow, Fukien	do	24	46	0-1
66439		do	do	26	47	0
Shanghai		E. Deschamps		24	44	0

## EUMECES PEKINENSIS Stejneger

1924. *Eumeces pekinensis* STEJNEGER, Occ. Pap. Boston Soc. Nat. Hist., vol. 5, July 26, 1924. p. 120 (type-locality, Hsin-Lung-Shan District, Imperial Hunting Grounds, Chilili, China; type, U. S. N. M. No. 60863; A. de C. Sowerby, collector).

*Diagnosis.*—Median dorsal scale rows not enlarged; two unpaired postmentals; lower temporal of the second row wedge-shaped; soles of hind feet nearly uniformly granular with only a few larger tubercles near the heel; a postnasal; 24 scales around the middle of the body.

*Description of type specimen.*—Rostral high, the portion visible from above somewhat larger than half the fronto-nasal; supranasals barely meeting behind rostral; nostril occupying most of nasal which is higher in front than behind; a small pentagonal postnasal in contact with supranasal, nasal, first and second labials and anterior loreal, the latter contact about twice as long as the others; fronto-

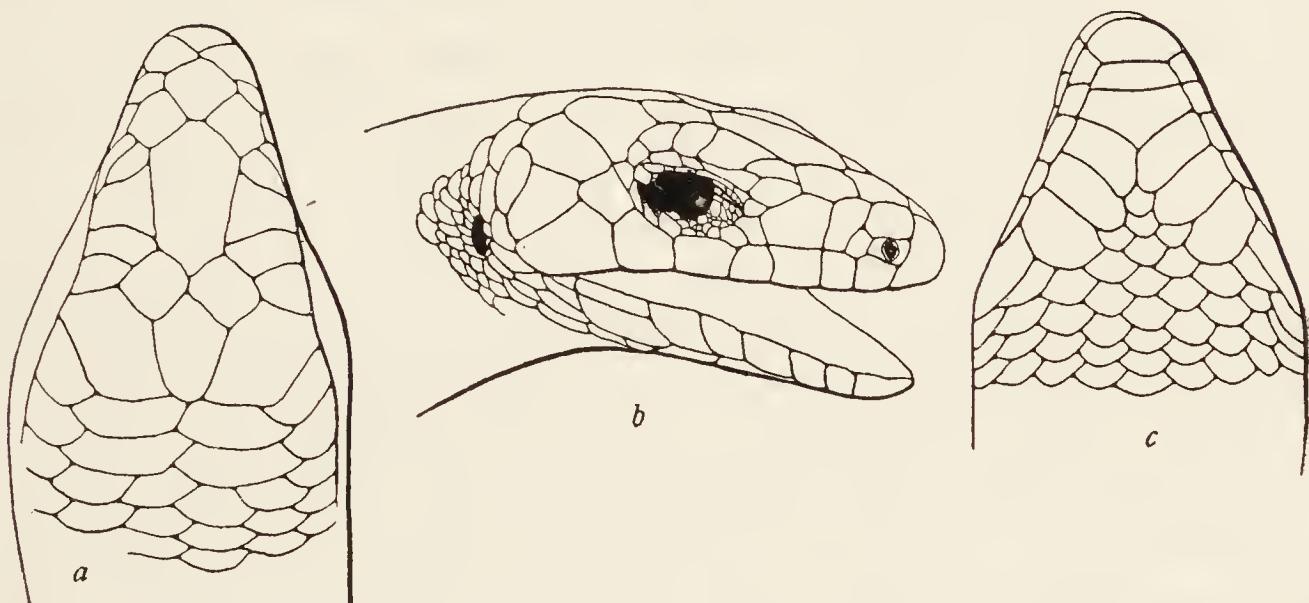


FIG. 2.—EUMECES PEKINENSIS. TYPE. U. S. NAT. MUS. NO. 60683. 3 × NAT. SIZE

nasal larger, as long as broad, barely touching rostral but in contact with frontal almost as widely as with anterior loreal; prefrontals smaller than fronto-nasal, separated from each other, in contact with frontal, fronto-nasal, both loreals, upper preocular and anterior supraocular; anterior loreal narrow, high, widening on canthus rostralis, in contact with first labial, barely touching second; posterior loreal pentagonal, large, wider than high, higher in front than behind, barely touching second labial and only in contact with fourth labial on left side; frontal considerably longer than parietals and its distance from the tip of the snout, anteriorly wider than behind, in contact with three supraoculars; four supraoculars, second largest; five superciliaries; fronto-parietals considerably smaller than interparietal; parietals shorter than frontals, widely separated behind by interparietal; two pairs of nuchals; seven supralabials, seventh largest, fifth under anterior half of eye; two large scutes covering the temples, the upper elongated with nearly parallel upper and

lower sides, in contact behind with anterior nuchals, the lower much wider behind, wedge-shaped, with the apex towards the front and narrowly in contact with the anterior temporal; two small scales between seventh supralabial and ear-opening, which is bordered anteriorly with three small lobules; mental medium, followed by two unpaired postmentals, the anterior narrow, band-like, with parallel anterior and posterior edges, the posterior larger, pentagonal, much wider than long; seven lower labials, sixth long and narrow; 24 perfectly smooth subequal scales around the middle of the body, 48 in a longitudinal series next to the median line of the back between nuchals and a line from groin to groin; a pair of large preanal plates; length of hind leg contained about twice and a half in distance from snout to vent; the adpressed limbs overlap by about the length of the fingers; scales on dorsal aspect of femur small, becoming abruptly much larger on underside, the largest being more than three times as large; sole of hind foot with subequal, small, nearly granular scales and a few larger ones near the heel; 14 scales under the fourth toe; a small scale behind each corner of the vent with a faint indication of a pointed keel or tubercle; tail gradually tapering, with a series of median, wide, transverse plates on the underside.

Color (in alcohol): above dark, nearly blackish brown, becoming paler brownish gray on terminal half of tail, with five longitudinal narrow yellowish stripes, one on the dorsal median line, the next on the middle of the third scale row from the median line, and a lateral one on the fifth and slightly also on the sixth scale row from the median line; the median stripe bifurcates on the interparietal shield proceeding forward over the frontoparietals and the lateral margins of the frontal, across the middle of the prefrontals meeting again on the rostral which is pale; the next stripe proceeds forward on the head over the outer edge of the supraoculars; the lateral stripe extends forward through the ear-opening and the lower half of the temples to the supralabials; the median stripe disappears on the terminal half of the tail, the next one on the basal third, and the lateral one just above and behind the insertion of the hind leg; underside from pectoral region forward and from groin backward pale buff, the intermediate region plumbeous, darkest on the posterior half of each scale.

## DIMENSIONS

	mm.
Total length	118
Snout to vent	53
Vent to tip of tail	65
Snout to ear opening	12
Greatest width of head	8.5
Axilla to groin	29
Fore leg	15
Hind leg	22

*Variation.*—Two additional specimens (Nos. 60864–5), collected by Mr. Sowerby with the type, agree with it in most details as described above; in fact, there is surprisingly little variation. In the head scales the most noteworthy difference consists in the relatively smaller size of the fronto-nasal, the supranasals in both these specimens being broadly in contact behind the rostral. In both the second loreal is in contact with the second and third labials. All three specimens have a well-developed postnasal, two postmentals, two pairs of nuchals, and 24 scale rows. The dorsal longitudinal rows consist of 48 scales in one and 50 in the other; one has 15 scales under fourth toe, the other has 13. The enlarged postfemoral scales are more localized as “patches” and are scarcely as large relatively as in the type. The postanal tubercle scale is scarcely recognizable.

*Remarks.*—This northern species presents characters which in their combination give it a central or, in appearance at least, an intermediate position between the Eumeces of China and Japan. In some respects it recalls *E. latiscutatus*, but the double postmental, longer snout, fewer scale rows, and especially the different arrangement of the two large temporals are features more than sufficient to separate them. With *E. elegans* it shares the enlarged post femorals, the postnasal, and the unspecialized granulation of the soles, but the latter has only one postmental, one pair of nuchals, more numerous scales under the fourth toe, and a temporal scalation like *E. latiscutatus*. It agrees with *E. chinensis* in having two postmentals and in the temporal scalation, but it has a postnasal, enlarged postfemorals, and the unspecialized foot soles.

This is the most northern record of a skink in China. It is possible that the *E. marginatus* reported by Elpatjewsky and Sabanejew,<sup>42</sup> or *E. latiscutatus*, as the specimens have been determined by Nikolski,<sup>43</sup> collected at Olga and St. Vladimir Bays and at Imperator Bay on the Ussuri coast of Siberia, may be this species. On the other hand, it is not impossible that true *E. latiscutatus* may have been accidentally introduced from Japan to the opposite coast of the Sea of Japan.

#### EUMECES TUNGANUS Stejneger

1896. *Eumeces xanthi* GUENTHER, Ann. Mus. Zool. St. Pétersbourg, vol. 1, p. 203 (Lifang-fu and valley of Tung River, Szechwan) (not of Guenther 1889).

1924. *Eumeces tunganus* STEJNEGER, Journ. Washington Acad. Sci., vol. 14, Oct. 4, 1924, p. 384 (type-locality, Luting Kiao, where road to Tatsienlu crosses Tung River, western Szechwan, 5–6,000 feet alt.; type U. S. National Museum, No. 66736; D. C. Graham, collector).

This interesting novelty was recently described from specimens collected by Rev. D. C. Graham during his trip to Tatsienlu. He

<sup>42</sup> Zool. Jahrb. Syst., vol. 24, 1906, p. 255, pl. 18, fig. 3.

<sup>43</sup> Fauna Rossij, Rept. vol. 1, 1915, p. 508.

obtained them at practically the same locality where 29 years before the Russian explorer G. Potanin had collected specimens which Guenther, apparently misled by the fact that they had two postmentals and a postnasal, wrongly identified with the *Eumeces xanthi* which he himself described only seven years previously from specimens collected by Pratt at Ichang.

#### SPHENOMORPHUS INDICUS (Gray)

To synonymy in Herpetology of Japan, 1907, p. 216, add :

*Lygosoma indicum* BOULENGER, Ann. Mus. Civ. Stor. Nat. Genova, ser. 2, vol. 13, 1893, p. 319 (Tung-Yung Isl.).—VOGT, Sitz. Ber. Ges. Naturf. Freunde, Berlin, 1914, p. 99 (Canton).

*Lygosoma (Hinulia) indicum* WERNER, Mitt. Naturh. Mus. Hamburg, vol. 27, 1910, p. 43 (Foochow).

*Sphenomorphus indicus* VAN DENBURGH, Proc. California Acad. Sci., ser. 4, vol. 3, Dec. 1912, p. 230 (Huchow, Che-Kiang).

This widely distributed species is represented by seven specimens, two adults and one very young from Mount Wa (Nos. 65457-9), and a young from Mount Omei, Szechwan, all by D. C. Graham, one adult by Prof. Blackwelder from Shi-Chuen-Hsien, Shensi (Nos. 35527) and two, one young and one adult from near Yenpingfu, Fukien (Nos. 65369 and 65368). The latter is very large, has 38 scale rows; the young one has 40 scale rows and in both only two supraoculars touch the frontal on *both* sides; in the young one the anterior projections of the frontoparietals are abnormally separated off as two small shields. The scale rows in the others are 34 in all four Szechwan specimens, and 36 in the one from Shensi; in all these 3 supraoculars are in contact with the frontal. It will thus be seen that as Boulenger has recorded 34 and 36 scales in eleven Fukien specimens,<sup>44</sup> this species goes through the whole gamut of variation from 34 to 40 scale rows in that province.

#### LEILOPISMA LATERALE (Say)

For synonymy see Herpetology of Japan, 1907, p. 218, to which add :

*Leiolepisma laterale* BARBOUR, Mem. Mus. Comp. Zoöl., vol. 40, no. 4, Aug. 1912, p. 135 (Washan, western Szechwan; Yünnanfu).

*Lygosoma reevesii* GUENTHER, in Pratt's To Snows of Tibet, 1892, p. 239 (mountains north of Kiukiang; and at Mo-si-mien Pass, 12,800 ft. alt., Szechwan).

*Lygosoma laterale reevesii* VAN DENBURGH, Proc. California Acad. Sci. (4) vol. 3, Dec. 1912, p. 237 (China and Tsushima).

Four Chinese specimens are now before me : One from Hsin-Lung-Shan district, Imperial Hunting Grounds, Chilili, 65 miles NE. of Peking, by Sowerby (U. S. Nat. Mus. No. 60862); one from Mount Omei, Szechwan, by Graham (No. 64640), and two from Nanking, Kiangsu, one by J. T. Illick (No. 65095), and one by Prof. C. Ping (No. 65522).

<sup>44</sup> Proc. Zool. Soc. London, 1899, p. 162.

These specimens show the usual variability of the species. The Szechwan specimen has 26 scale rows, the Peking one 30; the two from Nanking have 28. In other respects these two specimens which are of the same size differ more from each other than from the northern and western ones. No. 65095 is quite normal, the limbs being small, when adpressed to the side not meeting by the distance from eye to ear. In No. 65522 the tips of the longest digits meet, the feet being much better developed; in addition the internasal is divided by a regular suture.

#### LYGOSAURUS SOWERBYI Stejneger

1924. *Lygosaurus sowerbyi* STEJNEGER, Occ. Pap. Boston Soc. Nat. Hist., vol. 5, July 21, 1924, p. 120 (type-locality, Futsing District, Fukien, China; type, U.S.N.M. No. 65375; A. de C. Sowerby, collector).

*Diagnosis*.—Three large supraoculars; third supraocular in contact with parietals; parietals larger than fronto-nasal.

*Description of type*.—Adult: Rostral very broadly in contact with fronto-nasal; no supranasals; nostril oval, in a single nasal; no

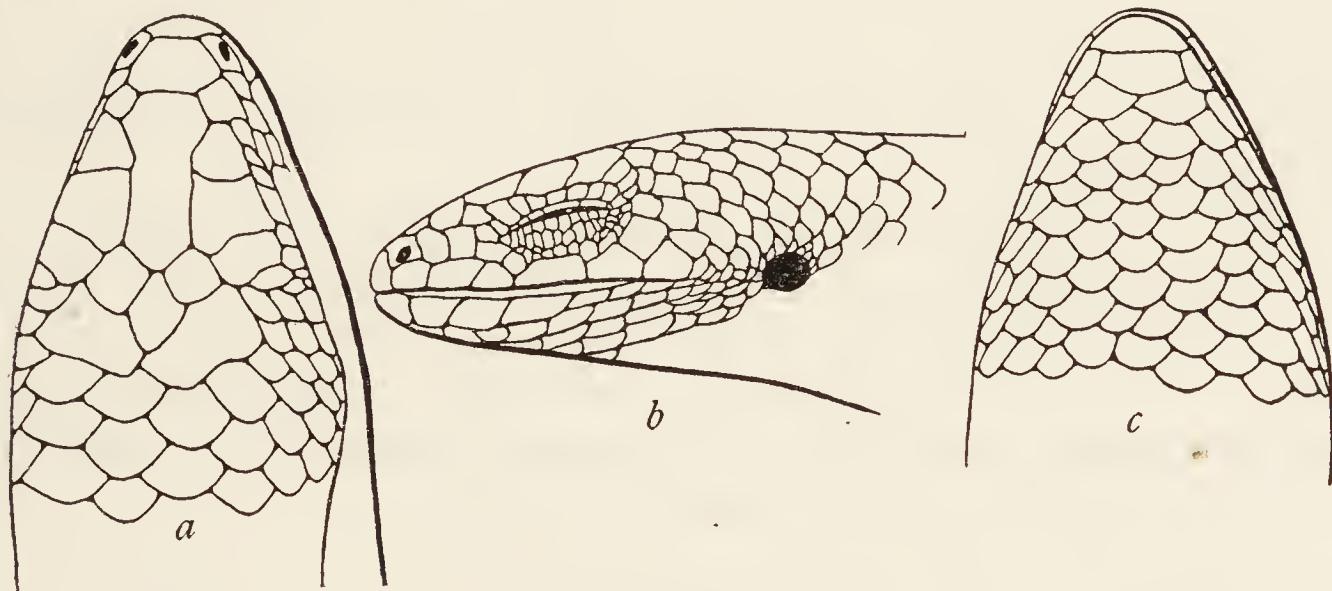


FIG. 3.—*LYGOSAURUS SOWERBYI*. TYPE. U. S. NAT. MUS. NO. 65375.  $4 \times$  NAT. SIZE

postnasal; fronto-nasal much broader than long, broadly in contact with frontal; prefrontals small, smaller than fronto-parietals, widely separated; frontal undivided, very long, though not quite twice as long as its distance from tip of snout, angularly emarginate laterally by the anterior supraocular, the anterior portion with the longer sides converging posteriorly, the posterior portion with the longer sides slightly diverging posteriorly, in contact laterally with first and second supraoculars, and behind with fronto-parietals and interparietal; three large supraoculars, second larger than first which is larger than third; first and second supraoculars in contact with frontal, third in contact with fronto-parietals and parietals; fronto-parietals, not in contact with each other, much smaller than third supraocular; interparietal much longer than wide, lozenge-shaped, in contact with frontal; parietals rather large, much larger

than fronto-nasal, in contact behind interparietal; no nuchals; two loreals, higher than wide, slightly smaller than prefrontals, in contact with first and second supralabials; lower eyelid scaly; six supralabials, fourth longest, about twice as long as the preceding ones; above fifth two small suboculars; temporals undifferentiated, scale-like, smooth; ear-opening moderate, round, with no projecting lobules; a single, pentagonal, narrow shield behind the mental; submandibulars small, scarcely differentiated; 28 rows of scales around the middle of the body, of nearly equal size, those on occiput and upper neck smooth, dorsals tricarinate, the keels increasing in distinctness posteriorly and reduced to two strong keels on the lower back and tail; scales on underside smooth; preanal scales not enlarged; legs short, hind leg being contained about three and one third times in distance from snout to vent, while fore and hind legs fail to meet by the length of the foot; digits short, first especially so, covered above with smooth imbricate, alternating scales, one on each side of the median line, the terminal enlarged and covering the base of the claw; tail cylindric, longer than head and body, tapering to a point; the caudal scales above with two strong keels which extend slightly beyond the edge of each scale, underneath smooth with rounded posterior edge; no transversely elongated scales underneath.

**Color (in alcohol):** Above pale brown, each scale darker at the base, the keels paler, and on the tail with scattered small whitish spots; flanks speckled with small black and white spots; sides of neck, from and including the ear, with large irregular black spots; temples speckled with black; supralabials whitish, above and below by a narrow black border; underside whitish.

	DIMENSIONS	mm.
Total length -----		102
Snout to vent -----		43
Vent to tip of tail-----		59
Snout to ear-opening-----		8.5
Greatest width of head-----		7
Axilla to groin -----		23
Fore leg -----		9
Hind leg -----		13.5

**Remarks.**—The discovery on the Chinese mainland of a second species of this most distinct genus is highly interesting. Only one species, *Lygosaurus pellopleurus*, was known from the middle and northern groups of the RiuKiu Archipelago,<sup>45</sup> but no species has been recorded from Formosa, though we may confidently expect its discovery there some day.

<sup>45</sup> Stejneger, Herpetology of Japan, 1907, p. 222, pl. 7, fig. 3.

The new species, though evidently closely related, differs very essentially from *L. pellopleurus* not only in the characters emphasized in the above diagnosis but also in the less elongate body, the longer tail, the fewer scale keels, and the coloration. The terminal scale covering the base of the claws is also a trifle smaller. As might perhaps be expected, the mainland species is somewhat less specialized, as shown by the larger parietals, the larger supraoculars, etc., but it does not link this genus any closer with any other forms composing the unwieldly Boulengerian genus *Lygosoma*. In this connection it may be recalled what I said about *Lygosaurus* not seeming to belong to the Himalayo-Chinese fauna, having, as it does, a structure reminding one of south Indian forms rather than of any genus or species peculiar to the northern mountains.

### Family LACERTIDAE

#### TAKYDROMUS SEXLINEATUS MERIDIONALIS (Guenther)

1864. *Tachydromus meridionalis* GUENTHER, Rept. Brit. India, p. 70, pl. 8, fig. D (type-locality, Southern China; types in British Mus.; J. Reeves, collector); Ann. Mag. Nat. Hist. (ser. 6), vol. 1, 1888 (p. 167).—BOETTGER, Offenbach. Ver. Naturk., 24–25 Ber., 1885, pp. 118, 142 (Canton and Lilong); Kat. Rept. Mus. Senckenberg, pl. 1, 1893, p. 79 (Nan-ning on the Yu-Kiang, prov. Kwangsi; Canton).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1904, p. 361.—VOGT, Sitz. Ber. Ges. Naturf. Freunde, Berlin, 1914, p. 98 (northern Kwangtung).

1887. *Tachydromus sexlineatus* BOULENGER, Cat. Liz. Brit. Mus., vol. 3, p. 4 (part: S. China); Monogr. Lacert., vol. 2, 1921, p. 151 (part: Amoy; South China).

It seems to me as if the last word about the forms which Boulenger includes in *T. sexlineatus* Daudin, has not been said yet, hence I retain the name *T. meridionalis* for the South China material at least for the present. Compared with specimens from the Malay Archipelago, which seem to be typical of *T. sexlineatus*, there appears to be enough differences to warrant the retention of the name of *T. meridionalis* in a subspecific sense. The head of the Chinese examples, five of which were collected by Mr. Sowerby in Fukien, are markedly shorter with resultant differences in the proportions of the various head shields; the number of lamellae under fourth toe are fewer; the number of inguinal pores is invariably one on each side; the prevailing number of ventral scale rows is twelve; besides differences in color and minor differences in scalation and proportion. The data relating to the South China specimens are given in the tables following.

*List of specimens of Takydromus meridionalis*

United States National Museum No.	Sex and age	Locality	When collected		By whom collected		Chin shields	Dorsal longitudinal rows	Dorsal transverse rows	Ven-tral transverse rows	Ven-tral longitudinal rows	Inguinal pores	Nasals in contact	Supra-oculars
			When collected	By whom collected	Chin shields	Dorsal longitudinal rows								
58326		Libon, Canton	1905	A. de C. Sowerby	3	4	29	26	12	1	22	0 barely	3	3
65370		Near Yen-ping Fu, Fukien			3	4	26	24	10	1	22	1	1	3
65371		do			3	4	28	24	12	1	22	1	1	3
65376		Futsin District, Fukien			3	4	29	26	12	1	23	1	1	3
65377		do			3	4	27	23	12	1	22	1	1	3
65378		do			3	4	27	24	12	1	22	1	1	3

*Measurements of Takydromus meridionalis in millimeters*

United States National Museum No.	Sex and age	Locality	By whom collected		Total	Snout to vent	Vent to tip of tail	Snout to fore limb	Length of head	Width of head	Fore limb	Hind limb
			When collected	By whom collected								
58326		Libon, Canton	1905	A. de C. Sowerby	49	—	—	17	11.5	6.5	16	21
65370		Near Yen-ping-Fu, Fukien			44	—	—	17	11	6	15	21
65371		do			143	53	* 90	18	12.3	6.5	17	23
65376		Futsin District, Fukien			159	49	* 110	18	12	6.5	16	22
65377		do			47	—	—	18	12	6	16	22
65378		do			44	—	—	16	11	6	15	20

<sup>a</sup>Tail reproduced.

**TAKYDROMUS SEPTENTRIONALIS Guenther**

For synonymy, see Herp. Japan, 1907, p. 232 (exclusive of references to Formosa). Add:

*Tachydromus septentrionalis* STEINDACHNER, Wiss. Ergebn. Reise Szechenyi Ost-Asien, vol. 2, 1898, p. 506 (Yumen-shien, Kansu).—BOULENGER, Mem. Asiat. Soc. Bengal, vol. 5, 1917, p. 216 (Kansu to Fukien); Monogr. Lacert., vol. 2, 1921, p. 137 (Along the Yangtse Kiang, northwest to Kansu, southeast to Fukien).

*Takydromus septentrionalis* VAN DENBURGH, Proc. California Acad. Sci. (4) vol. 3, 1912, p. 242 (Mohkansan and Huchow, Chekiang).

The National Museum has now eight Chinese specimens of this species, two from the province of Shensi, two from Kiangsu, three from Szechwan, and one from Fukien. The occurrence at Suifu and Mount Omei, where Mr. D. C. Graham also collected *T. intermedius*, is very interesting. The variation in the characters considered diagnostic of the species is shown in the table of specimens herewith. To be noted is, that one specimen has 4 postmentals on one side, and the larger anterior one opposite nicked in the inner edge by an incipient suture. The dorsal rows are very variable, there being 6 subequal scales in two specimens; 4 large and 2 small median rows in two; 7 rows consisting of 6 large with a median small row in two; and 1 with 6 large and 2 median smaller rows. In Nos. 65460 and 66735, the dorsal scale rows change at the middle of the back from 3-1-3 anteriorly to 2-2-2 posteriorly. In five specimens there are 2 lateral enlarged rows adjoining the ventrals on each side, while in three specimens the sutures of the rostral, nasals, and fronto-nasals meet in such a way that it is difficult to say whether the rostral and fronto-nasals touch or not. In two specimens, one from Nanking (No. 65092) and one from Szechwan (No. 65460) there is a well-developed masseteric scute on the temple. The anterior supraocular varies in size from a mere granule to a well-indicated shield. In one (No. 65092) it is absolutely wanting, and the large second supraocular in this specimen is in contact with the posterior loreal.

*List of specimens of Takydromus septentrionalis*

United States National Museum No.	Sex and age	Locality	When collected	By whom collected	Chin shields	Dorsal longitudinal rows	Ventral transverse rows	Ventral longitudinal rows	Inguinal pores	Lamellae scales under fourth toe	Nas. in cont. behind rostr.	Supraoculars
35525	Female, adolescent	Liang Ho, Chin Ling Mountains, Shensi.	E. Blackwelder	3	7	36	30	1	8	27	4	4
35526	Juvenile	Hsiao Wang Chien, Chin Ling Mountains, Shensi.	do	3	6	33	29	8	1	25	-	4
64684	do	Spirit Valley, Nanking	3-4	8	33	33	8	1	1	27	-	4
65092	Male, adolescent	Nanking, Kiangsu Province	Oct. 24, 1919	Cook & Loomis	6	35	29	8	1	27	-	3
65460	Adolescent	Near Mount Wa, Szechwan	April, 1922	J. T. Illick	3	34	30	8	1	25	-	4
65817	Adolescent	Suifu, Szechwan	do	D. C. Graham	3	36	29	8	1	27	-	4
66735	Adolescent	Shen-Kai-Si, Mount Omei	July-Aug., 1923	do	3	37	28	8	1	1	-	4
68445	Adolescent	Foochow, Fukien	A. deC. Sowerby	3	6	32	27	8	1	26	-	4

**TAKYDROMUS AMURENSIS Peters.**

For synonymy and figures, see Herp. Japan, 1907, p. 245.  
Add:

*Tachydromus amurensis*  
NIKOLSKI, Fauna Rossij, Rept., vol. 1, 1915, p. 271 (Ussuri; Vladivostok).— BOULENGER, Mem. Asiat. Soc. Bengal, vol. 5, 1917, p. 210, pl. 46, figs. 1-1d (S. E. Siberia; Manchuria; Korea); Monogr. Lacert., vol. 2, 1921, p. 129 (Ussuri; Korea).

A fine female specimen (No. 52344) of this species was collected by Mr. Sowerby on the north bank of the Yalu River, 180 miles from its mouth, in southern Manchuria. It has six dorsal series of large scales with a single median series of smaller ones; eight ventral series with at least three enlarged lateral series adjoining them on each side; there are only three pairs of chin shields, first and second being fused; rostral broadly in contact with frontal-nasal; temporals rather large; anterior supraocular not much smaller than fourth, touching second loreal.

**TAKYDROMUS INTERMEDIUS Stejneger**

1924. *Takydromus intermedius* STEJNEGER, Occ. Pap. Boston Soc. Nat. Hist., vol. 5, July 21, 1924, p. 120 (type-locality, Shin-Kai-Si, Mount Omei, near Kiating, Szechwan, China; type U.S.N.M. No. 64437; Rev. D. C. Graham, collector).

*Diagnosis.*—Head one and three-fourth times to twice as long as broad; anterior supraocular very small, mostly indicated by a minute granule; enlarged dorsals in eight longitudinal series, the two median ones smaller; ventrals in six series, smooth or very feebly keeled; four pairs of chin shields; two inguinal pores on each side; nasals in contact behind rostral; tail two and one-half times to three times the length of head and body.

*Description of type specimen.*—Adult female: Rostral separated from internasal by anterior nasals which are broadly in contact; posterior loreal much larger than anterior; internasal as long as prefrontals which are about two-thirds the length of the frontal; two large supraoculars, the anterior barely separated from the posterior loreal by a granule which represents the first supraocular; fourth supraocular very small, smaller than occipital; four superciliaries, two anterior ones in contact with large anterior supraocular,

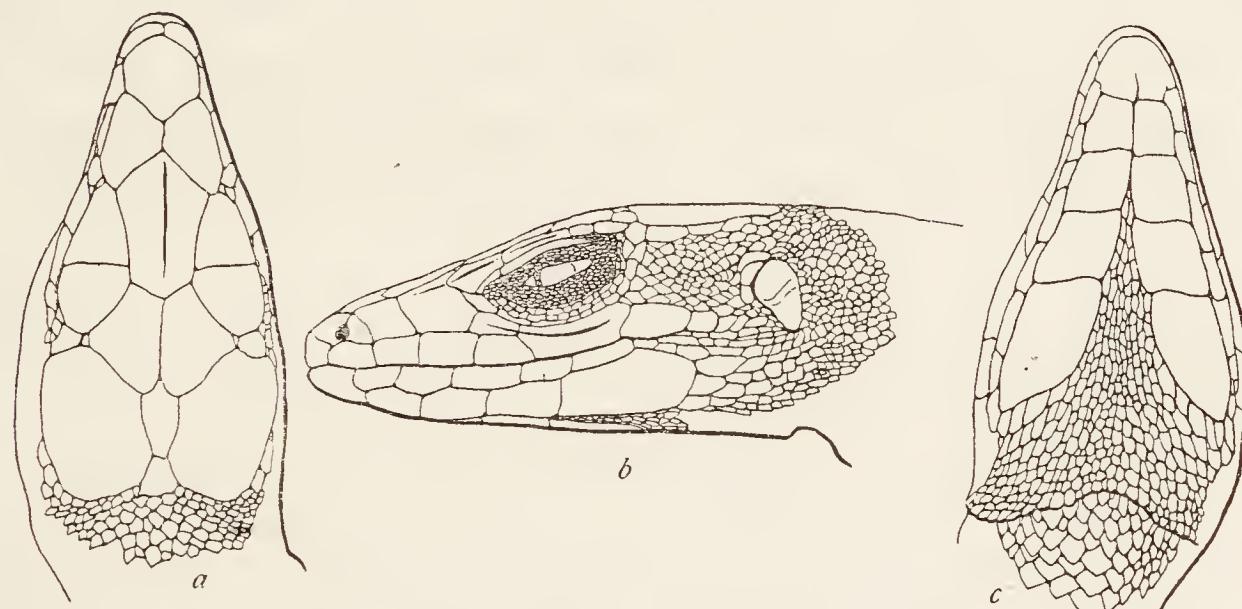


FIG. 4.—*TAKYDROMUS INTERMEDIUS*. TYPE. U. S. NAT. MUS. NO. 64437. 3 X NAT. SIZE

the two posterior ones separated from the second large supraocular by a series of minute granules; frontal hexagonal, with a median ridge, and much wider anteriorly than posteriorly; fronto-parietals in contact with posterior large supraocular (third) but separated from fourth by a granule; parietals large, considerably longer than frontal; four supralabials in front of the subocular labial which is largest and as long as third and fourth together; temporals small, almost granular, keeled, about 10 in a row between postocular and the elongate scales bordering the ear-opening anteriorly; a series of four elongate narrow scales along the outer edge of the parietals; four pairs of chin shields, increasing in size posteriorly, first pair in contact throughout, second only in anterior half; eight dorsal rows of keeled scales, the two median series small and irregular, on the posterior half of the back reduced to a single row; keels of large dorsals forming continuous ridges, four of the large dorsals corresponding to about four and one-half ventral plates; sides covered with minute

keeled scales gradually enlarging toward dorsals and ventrals, about 14 in a transverse row; scales on upper surface of limbs, like dorsals, the largest scarcely smaller; gulars granular, considerably elongated anteriorly between the chin shields and merging gradually posteriorly into the pointed and keeled scales covering lower neck and collar, about 29 granules and scales on the median line between chin shields and collar; a distinct gular fold; 6 rows of ventral plates, all smooth except outer row which is slightly narrower, keeled and pointed, abruptly set off from the adjoining small-keeled scales of the flanks, 25 on the median line from collar to preanal plate; preanal plate large, smooth, with two narrow scales on each side; two inguinal pores on each side; subdigital lamellae under fourth toe 27; tail three times as long as head and body together with strongly keeled and pointed scales which are about as long as the large dorsals.

**Color (in alcohol):** Dark olive gray, outer dorsal row faintly paler; a narrow pale line from posterior supralabials on side of neck below tympanum to shoulder; entire underside bluish gray except underside of arms and legs (but not hands and feet) whitish.

	DIMENSIONS	mm.
Total length		210
Snout to vent		52
Vent to tip of tail		158
Snout to collar		18
Snout to posterior edge of occipital		13
Snout to ear-opening		11.5
Snout to posterior edge of ear-opening ("length of head")		13
Greatest width of head		7
Fore leg		20
Hind leg		27

**Variation.**—The variations of the five specimens in proportions and structural details may be seen from the appended tables. It may be added that all have the nasals in contact behind the rostral. The internasal, or fronto-nasal, is not always as long as in the type; the first (small) supraocular, may be almost as large as the fourth, or may be reduced to a mere pin point; second pair of chin shields may be in contact throughout their length; otherwise there is a very great uniformity in the series.

**Remarks.**—The Szechwan species here described seems to be so intermediate between the various forms of this genus as to well merit the name I have given it. An attempt to identify the five specimens before me by the "Synopsis" in Boulenger's excellent Monograph of the Lacertidae,<sup>46</sup> at once demonstrates the central po-

<sup>46</sup> Vol. 2, 1921, p. 128.

sition of the species here described. In that synopsis the species of this genus are divided into those with "I. Head not more than one and three quarter times as long as broad," and those with "II. Head at least nearly twice as long as broad"; in other words, the ratio between breath and length of head in Group I is 1:1.75, or less; in Group II it is "nearly" 1:2, or more, or if we interpret the "nearly" as "minus 0.1" the ratio in Group II may be said to be 1:1.85. The table of measurements shows that in the new species the ratio varies between 1:1.75 and 1:2, averaging in the five specimens 1:1.88, or halfway between the two groups with a leaning towards Group II. That this is the correct interpretation is evident from an examination of the ratios given by Boulenger himself for three of the species composing Group II, namely, *T. smaragdinus*, *T. sauteri*, and *T. sexlineatus*, in which according to his figures the ratios are respectively 1:1.85; 1:1.93 and 1:1.98. The Szechwan specimens must therefore be tested both in Groups I and II, and as the elongated head points towards the latter, they may be looked for first in that category. Having eight dorsal rows of scales (or plates) and ventrals in six series they ought to be found under *A*, and having four pairs of chin shields they might be suspected of belonging to *T. sauteri*, hitherto only known from Formosa. But this is a very different species with sharply keeled ventrals, one inguinal (femoral) pore, two or three series of keeled scales on the sides above the ventral plates and only 24 lamellae under fourth toe. Tried in Group I, which falls in two Groups *A* and *B*, the latter with four dorsal series, 12 ventrals and three pairs of chin shields, they should be looked for in Group *A* in spite of the fact that the species contained in that group are said to have ventrals in eight or 10 series, while our specimens only have six. *A* is divided in those with "1. four or five pairs of chin shields" and "2. three pair of chin shields." As ours have four pairs the choice is limited to *T. amurensis*, *T. tachydromoides*, and *T. wolteri*. Of these *T. amurensis* has three inguinal pores, and *T. wolteri* one pore, and both have eight ventral series, while ours have two pores and six ventral series. Finally, *T. tachydromoides*, from Japan, like our species, has two inguinal pores and four chin shields, but the number of dorsals and ventrals is reversed, namely, six dorsal and eight ventral rows, while *T. intermedius* has eight dorsal and six ventral rows, besides, having much longer head and various peculiarities of its own, such as the numerous granules covering the temples, lack of well-developed "plates" on the flanks adjoining the ventrals; more numerous lamellae under the fourth toe; nasals in contact behind rostral, etc.

*List of specimens of *Takydromus intermedius**

United States National Museum No.	Sex and age	Locality	When collected		Dorsal scale rows	Dorsal transverse rows	Ventral transverse rows	Ventral longitudinal rows	Inguinal pores	Lamellae scales under fourth toe
			By whom collected	Chin shields						
63594	Adolescent	Suifu, Szechwan	D. C. Graham	4	35	26	6	2	28	
64425	do	Mount Omei, Szechwan	1921	4	30	24	6	2	28	
64437 <sup>a</sup>	do	Mount Omei, Shin-Kai-Si, Szechwan	1921	4	32	25	6	2	27	
65467	do	Mount Omei, Szechwan	do	4.5	31	25	6	2	27	
65933	do	Suifu, Szechwan	1923	4	34	24	6	2	27	

<sup>a</sup> Type.*Measurements of *Takydromus intermedius* in millimeters*

United States National Museum No.	Sex and age	Locality	When collected		Total	Snout to vent	Vent to tail tip	Snout to fore limb	Length of head	Fore limb	Hind limb	Fcet
			By whom collected	Chin shields								
63594	Adolescent	Suifu, Szechwan	D. C. Graham	160	48	112	19	12	6	19	25	13
64425	do	Mount Omei, Szechwan	1921	181	48	133	—	12	6.5	—	—	—
64437 <sup>a</sup>	do	Mount Omei, Shin-Kai-Si	1921	210	52	158	19	13	7	20	27	14
65467	do	do	do	138	36	102	—	10.5	6	—	—	—
65933	do	Suifu, Szechwan	1923	197+	55	142+	—	13.5	7	—	—	—

<sup>a</sup> Type.

**EREMIAS ARGUS Peters**

For synonymy see Herpetology of Japan, 1907, p. 248, to which add:

*Eremias argus* STEINDACHNER, Wiss. Ergebn. Reise Szechenyi Ost-Asien, vol. 2, 1898, p. 505 (Su-chou, Kansu).—ELPATJEWSKY and SABANEJEW, Zool. Jahrb. Syst., vol. 24, 1906, p. 252 (Gussonoye Osero, Seleginsk Distr., Transbaikal).—SOWERBY, in Clark and Sowerby's Through Shen-kan, 1912, p. 110 (Kansu).—BEDRIAGA, Wiss. Res. Przewalski Central-Asien Reis., Zool., vol. 3, sect. 1, Amph. Rept., pt. 4, June, 1912, p. 636 (Ordos; Alashan).—NIKOLSKI, Fauna Rossij, Rept., vol. 1, 1915, p. 460 (Mongolia, etc.).—BOULENGER, Monogr. Lacertid., vol. 2, 1921, p. 336 (Manchuria, Korea, Mongolia, North China).

Ten specimens of this species have been collected by Sowerby on three of his expeditions to the Mongolian frontier, namely, two (Nos. 39340 and 39341) from the province of Kansu, the first at a locality 5 miles south of San-chow-fu (about 5,100 feet altitude) on June 21, 1909, and the second one near Ching-yang-fu (about 3,100 feet) on August 8, 1909; one (No. 49644) at Kuli-hua-cheng, northern Shansi, during May, 1912; and seven at the Imperial Hunting Grounds, Chilili, 65 miles N. E. of Peking during August, 1917.

They show the usual variations of this species, but none have the subocular forming part of the labial edge, as in the so-called *E. brenchleyi*, nor do any of the specimens approach the other characters attributed to this much debated form. In all the specimens the fronto-nasal is divided, except in No. 49644, nor does this specimen have any small scales or granules intercalated on the snout; in addition, it possesses an unusually small interparietal. Among the other specimens, No. 39340 from LanChow, Kansu, which I have examined very closely for possible relationship to *E. multiocellata*, which has also been recorded from Kansu (type specimen of *E. planiceps* Strauch), has a divided fronto-nasal, and the length of the anterior large supraocular is not greater than its distance from the second loreal.

It is true that an occasional specimen of *E. multiocellata* is found with a divided fronto-nasal (Petrograd Mus. No. 5124, from Balgantai-gol, Tian-shan, Col. Przhevalski, collector) and that the granules filling the anterior supraocular triangle are unusually large and coarse, but this space itself is not smaller than in typical *E. argus*, and the specimen does not otherwise differ from normal individuals of this species.

**Family ANGUIDAE****Genus OPHISAURUS Daudin**

For synonymy see Proc. U. S. Nat. Mus., vol. 38, May 3, 1910, p. 102.

**OPHISAURUS HARTI Boulenger**

1899. *Ophisaurus harti* BOULENGER, Proc. Zool. Soc. London, 1899, p. 160, pl. 16 (type locality, Kuatun, Fukien, China; cotypes in Brit. Mus.; J. D. La Touche, collector.)—STANLEY, Journ. N. China Asiat. Soc., vol. 45,

1914, p. 26 (Fukien); vol. 47, 1916, p. xiv (Fukien).—STEJNEGER, Proc. Biol. Soc. Washington, vol. 32, June 27, 1919, p. 142 (Formosa; within 200 miles of Foochow, Fukien).—WERNER, Mitt. Naturh. Mus. Hamburg, vol. 27, 1910, p. 27 (Fukien).

1905. *Ophisaurus ludovici* MOQUARD, Bull. Mus. Nat. Hist., Paris, 1905, (p. 76) (type-locality, Bao-Lac, Tonkin, near Chinese frontier; type in Paris Mus.; Louis Vaillant, collector); 1910, p. 1, figs. 1a-c.

In addition to the specimen (No. 60575) collected by C. R. Kellogg "within 200 miles of Foochow," already recorded by me, the National Museum has recently received from C. H. Barlow an adult specimen, with reproduced tail, from Moh-Kan-Shan, Chekiang. This specimen which is without cross-markings is (in alcohol) of a pale bluish gray above, slightly darker on the six median scale rows; at about halfway between dark bluish gray stripe begins on the center of the fourth scale row from the lateral groove, which increases in width and intensity backwards until on the side of the tail it occupies the adjacent halves of third and fourth scale rows. The head scales are essentially like Boulenger's figure of the type, except that the occipitals are slightly larger and better differentiated. There are 104 transverse series of body scales counted from beginning of lateral groove to vent; dorsals and ventrals, in a series around the body, are 16 and 10 respectively.

## Suborder SERPENTES

### Family TYPHLOPIDAE

#### TYPHLOPS BRAMINUS (Daudin)

For synonymy see Herpetology of Japan, 1907, p. 260, to which add:

*Typhlops braminus* STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 26 (Fukien).

*Typhlops bramineus* STANLEY, Journ. N. China Asiat. Soc., vol. 47, 1916 p. xiii (Yeung Yang, south China); p. xv (Changning via Swatow).

A young specimen (No. 65380) from the Futsing district, Fukien, has been received from Mr. Sowerby.

### Family COLUBRIDAE

#### Genus SIBYNOPHIS Fitzinger

See Stejneger, Proc. U. S. Nat. Mus., vol. 38, May 3, 1910, p. 102.

#### SIBYNOPHIS COLLARIS<sup>47</sup> CHINENSIS (Guenther)

1889. *Ablabes chinensis* GUENTHER, Ann. Mag. Nat. Hist. (ser. 6), vol. 4, p. 220; in Pratt's To Snows of Tibet, 1892, p. 240 (type locality, Ichang, Hupeh; type in Brit. Mus.; A. E. Pratt, collector).

1893. *Ablabes sinensis* BOULENGER, Cat Snakes Brit. Mus., vol. 1, pp. 184, 185, 444 (emendation in synonymy).

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<sup>47</sup> For Synonymy of *S. collaris collaris* see Proc. U. S. Nat. Mus., vol. 38, 1910, p. 103, to which add: *Polyodontophis collaris* WALL, Proc. Zool. Soc. London, 1903, p. 85 (Hong Kong Island).

1899. *Polyodontophis collaris* BOULENGER, Cat. Snakes Brit. Mus., vol. 1, pl. 12, fig. 1b-1c (Ichang, Hupeh); Proc. Zool. Soc. London, 1899, p. 162 (not of Gray) (Kuatun, Fukien).—ANGEL, Bull. Mus. Hist. Nat. Paris, 1920, no. 2, p. 112 (Kweichow).

The specimen from Ichang, upon which Guenther based his *Ablabes chinensis*, has two anterior temporals, as mentioned and figured by Boulenger (pl. 12, fig. 1 c), the lower one being interpreted as the eight supralabial "excluded from the labial margin."<sup>48</sup> Boulenger, however, reduced Guenther's name to a synonym under *Polyodontophis collaris*, of which he had 11 specimens from the Khasi Hills, Nepal and Darjeeling, in the Himalaya, as well as from Burma, none of which had a separate lower anterior temporal. Later he received two specimens from Kuatun, Fukien, both of them agreeing with Guenther's type from Ichang in the temporal arrangement, but having found this character to be inconstant in *P. subpunctatus* and *P. bistrigatus* he expected that it "would likewise break down if a larger number of Chinese specimens could be examined."

The United States National Museum has two more specimens to add to the Chinese record, viz, No. 66435 collected by Sowerby at Foochow, and No. 35521 from Shih-chuan-hsien, on the Han River in southern Shensi, by Prof. E. Blackwelder. In both of these the lower anterior temporal is widely separated from the labial edge, as is also the arrangement in the type specimen as figured by Boulenger (fig. 1c). If this figure be compared with that of the normal *S. collaris*, fig. 1a, it will be seen that this temporal is really the upper part of the eight labial separated off and not the eight labial forced off the labial edge. It should also be noted that in the two specimens before me the parietal is in contact with the lower postorbital, a character supposed to distinguish *S. geminatus* and *S. subpunctatus*. In addition to the separate lower temporal, the five Chinese specimens known show a greater number of ventrals than the western form. From the table given below, it appears that the former have from 178 to 187 ventrals, while in the nine specimens of the latter listed by Boulenger, the number of ventral ranges between 159 and 180. Finally, our specimens from Shensi and Fukien agree exactly in color pattern with that of the type from Ichang (Boulenger, fig. 1b) as contrasted with that of the regular *S. collaris* (fig. 1.).

Taking all the above facts into consideration, I consider it desirable to retain the name given by Guenther for the Chinese specimens.

Since the above was set in type the National Museum has received another specimen from Mr. Sowerby, collected at Kuliang. It is

<sup>48</sup> Probably similarly interpreted by Guenther, as he gives the temporal formula as 1 + 2 in the original description.

essentially like the two other specimens, having the lower anterior temporal widely separated from the labial edge, but the parietal is separated from the lower postorbital. It is a female, No. 67737 and its scale formula is as follows: sc. 17; v. 178; a. 2; subc. 124; oc. 1-2; t. 2+2; supral. 9.

### Genus NATRIX Laurenti

Three names of water snakes (*Natrix*) occurring in southeastern China cluster around the identical scale formula: 19 sc.; 132-164 v.; 2 a.; 51-77 subc.; 1-3 or 4 oc.; 2+3 temp., namely, *N. annularis*, *N. habereri*, and *N. percarinata*. This formula overlaps that of a fourth species of wide distribution but extending its range into the same region, namely *N. piscator*, the formula of which is: 19 sc.; 125-150 v.; 2 a.; 70-90 subc.; 1-3 (4) oc.; 2+2 or 3 temp. The character relied upon for distinguishing the latter has been that two or three outer scale rows were supposed to be smooth and only one in the other three forms. We now know that this distinction does not hold. Speaking of the character assigned to *Natrix asperrima*, viz, one unkeeled row of scales as against two or three in *N. piscator*, Doctor Wall states that he examined many hundreds of Indian *piscator* and found that the number of rows not keeled is variable. He also examined several of the Ceylon form *asperrima* most critically, besides the Indian *piscator*, and could not discover any constant character whereby the two can be separated. In addition it now turns out that both the types of *N. annularis* and *N. habereri* have three smooth, or nearly smooth, outer scale rows, and that in several other specimens of this form the second scale row is more or less smooth. It will be noticed, however, that in the

*List of specimens of Sibynophis chinensis*

Museum	No.	Sex and age	Locality	When collected	By whom collected	Scale rows	Ventralis	Anal	Subcaudals	Oculars	Parietals	Temporals	Supralabials
British..	Type				A. E. Pratt	17	<sup>a</sup> 187						9
Do.					J. D. La Touche		184						
Do.					do		178						
United States National	35521	Female	Ichang, Hupeh..		E. Blackwelder	17	187	2	110	1-2	2+2	2+2	9
Do.	66435	Male..	Kuautun, Fukien..		A. deC. Sowerby	17	180	2	110	1-2	2+2	2+2	9
			do										
			South Shensi..										
			Fuchow, Fukien..										

<sup>a</sup> Acc. to Boulenger; Guenther's original description has 182.

scale formulas as given above *N. piscator* has a relatively shorter body and longer tail, but no absolute line can be drawn; it also has the fourth and fifth supralabials entering the eye, but we have numerous examples of *N. annularis*, etc., in which the fifth labial touches the eye, though possibly not to the same extent.

In *N. piscator*, moreover, the second row of temporals usually consists of only two scales. Concomitant with this we find that the

*Number of ventrals and subcaudals in Natrix piscator, percarinata, and annularis based on published records of 72 specimens*



FIG. 5.—Number of ventrals:

— *Natrix piscator*, 43 records.  
- - - - - *Natrix percarinata*, 8 records.  
. . . . . *Natrix annularis*, 21 records.

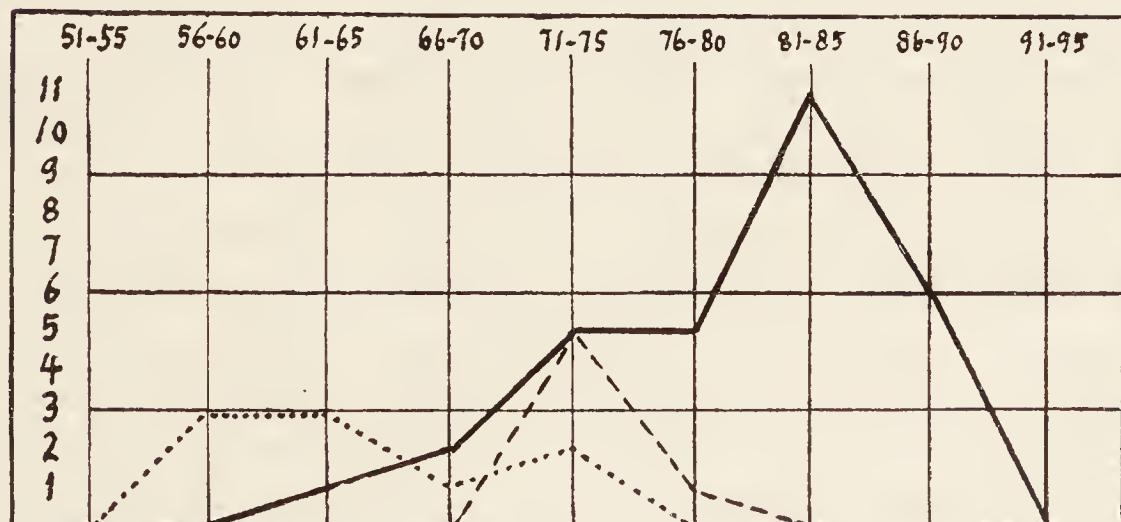


FIG. 6.—Number of subcaudals:

— *Natrix piscator*, 30 records.  
- - - - - *Natrix percarinata*, 6 records.  
. . . . . *Natrix annularis*, 18 records.

(normally) eighth supralabial is pentagonal and much higher, with an angular upper border much greater than the labial border, while in *N. annularis* this shield is nearly quadrangular with parallel upper and lower borders. These characters in conjunction with the strongly marked color-pattern of the postocular region in *N. piscator* suffice in all cases to identify this common species.

The scale formula of the three other names upon further analysis will be found to be composite. The curves of the number of ventrals and subcaudals (figs. 5–6) show that in reality *N. percarinata* has the same short body and long tail as *N. piscator*, while in *N. annularis* the body is relatively much longer and the tail shorter. No separate diagram of *N. habereri* could be given as only the extremes of the six cotypes are given, namely, 163–164 ventrals and 53–65 subcaudals, but these figures are clearly within the curve of *N. annularis*. As the chief distinction of *N. habereri* is supposed to be the smoothness of the three outer scale rows and as this character has been shown to be of no significance, there can scarcely be any objection to following Boulenger's example in regarding *N. habereri* as a synonym of *N. annularis*.

#### NATRIX ANNULARIS Hallowell

1856. *Tropidonotus annularis* HALLOWELL, Proc. Acad. Nat. Sci. Philadelphia, 1856, p. 151 (type-locality, Ningpo, China; type in Mus. Phila. Acad.; Dr. McCarter, collector).—BOULENGER, Cat. Snakes Brit. Mus., vol. 1, 1893, p. 233; vol. 3, 1896, p. 605 (Mts. N. of Kiukiang; Chikiang; Ningpo; Da-laen-saen, SW of Ningpo; Formosa).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 363.—STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 28 (Kiangsu; Chekiang; Fukien).—GEE, Journ. N. China Asiat. Soc., vol. 50, 1919, p. 184 (Soochow, Kiangsu).

*Natrix annularis* STEJNEGER, Herp. Japan, 1907, p. 291 (Formosa).

1859. *Tropidonotus chinensis* "Jan" BERTHOLD, Nachr. Univ. Ges. Wiss. Goettingen, No. 17, Sept. 12, 1859, p. 180 (type locality, China; type in Mus. Goettingen).

1859. *Tropidonotus semifasciatus* BERTHOLD, Nachr. Univ. Ges. Wiss. Goettingen, No. 17, Sept. 12, 1859, p. 180 (alternative name).

190. *Tropodonotus habereri* WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 190, p. 54, pl. 1, figs. 1–2 (type locality, Ningpo Mts. near Shanghai; types in Mus. Munich; Dr. Haberer, collector).

Two specimens from Fukien, No. 64644 collected by C. R. Kellogg at Kuliang, and No. 65409, by Mr. Sowerby at Foochow, belong undoubtedly to this species. This is rather surprising in view of the fact that the related *N. percarinata* was described from this province. Nevertheless, both structurally and in coloration they are typical *N. annularis*. The scale formulas are given below. In addition it may be stated that No. 65409 on both sides and No. 64644 on the left side have nine supralabials, fifth higher than fourth and sixth, and exclusively touching the eye, while on the right side there are only eight labials, the fourth only touching the eye. In both specimens the rostral is nearly as wide as high, the interparietal suture is as long as the frontal and longer than the latter's distance from the tip of the snout, and the diameter of the eye equals the width of the frontal in the middle. In both, the keels on the second scale row are very faint or even entirely absent. No. 64644 has 38 black rings on the under side of the body No. 65409 has 39. Both have supralabials white, edged with black.

United States National Museum No.	Sex and age	Locality	By whom collected			Scale rows	Ventralis	Anal	Sub- caudals	Labials	Oculars	Tempo- rals	Smooth scale rows
			When collected										
64644	Female	Kuliang, Foochow, Fukien--	Aug. 21, 1921	C. R. Kellogg-----		19	152	2		?	9	1-3	2+3
65409	Female	Foochow, Fukien-----	do-----	A. deC. Sowerby-----		19	151	2	59		9	1-3	{ $\frac{1+3}{2+3}$ }
66856	Male	Wenchow, Chekiang-----		Prof. C. Ping-----		19	161	2	53-		9	1-3	2+3

## NATRIX AEQUIFASCIATA Barbour

1908. *Natrix aequifasciata* BARBOUR, Bull. Mus. Comp. Zoöl., vol. 51, no. 12, April, 1908, p. 317 (type-locality, Mt. Wuchi, Central Hainan; type. Mus. Comp. Zoöl., No. 7101).

Karl P. Schmidt, after examination of the type, has kindly informed me that a specimen from Fukien in the National Museum, which I showed him during his recent visit in Washington, belongs to Barbour's species, originally described from the island of Hainan. Doctor Barbour, to whom I then submitted it for direct comparison with his type material, writes me as follows:

The *Natrix* arrived and we, i. e., Mr. Loveridge and I, compared it most critically with our two cotypes of *N. aequifasciata*. They are surely the same. At first sight our specimens looked widely different but they are young and the wide-bowled, black and white crossbars evidently disappear with age to be almost obliterated as with your big specimen, while the ventral blotches mark the position of the rings.

As regards details of head squamation there are no differences worth mentioning. The heads are shorter in our two cotypes, no doubt an age character and the only thing which suggests that possibly a series might prove separable, did we have adults and young from the two localities, is the fact that in both of the Hainan specimens the prefrontals tend to be proportionately a little shorter than in the snake from the mainland. The pre and postocular regions and the temporal regions show some little variability for one of our cotypes has two preoculars on both sides and the other but one, while one has three postoculars on one side and four on the other, the second specimen has four on both, the fourth a tiny scale so placed that it might be almost called a subocular. Then on one side of one of my cotypes the two anterior temporals are fused into a single large scale which is followed by three temporals. In the other case this same condition of 2+3 obtains, but the five scales vary greatly in shape, size and position.

The specimen (U. S. Nat. Mus. 65389) is a male, collected by Mr. Sowerby at Yenping-fu, with tuberculated chin-shields; the body scales are very strongly carinated, even some of the outer row showing indications of keel; the rostral is less high than in *N. annularis*, and is only just visible from above; the parietals are very short, the interparietal suture being shorter than the frontal and shorter than the latter's distance from the rostral; the snout is very elongate, as shown by the exceedingly long internasals, the long anterior nasal, the long loreal which is much longer than high; the supralabials, nine in number, are unusually long, especially the seventh; they are of subequal height, even the fifth which borders the eye below; three postoculars, of which the lower one is small and triangular so that the upper anterior corner of the sixth supralabial just touches the eye; the eye is relatively large, the diameter considerably exceeding the width of the frontal at the middle; frontal rather large with concave sides. The scale formula is as follows: sc. 19; v. 148; a. 2; subc. 73; l. 9; oc. 1.-3; temp. 2+3.

It will thus be seen that structurally it agrees very well with the original description of *N. percarinata* which Boulenger characterizes as distinguished from *N. annularis* by the larger eye, broader rostral and shorter parietals.

The coloration, however, is very different, except in the absence of dark edges to the supralabials. Boulenger's type has "the four anterior upper labials grayish olive like the upper surface of the head, the rest uniform yellowish white like the lower surface" and our specimen has them all dark, but that seems of little importance and may have to do with the greater size of the latter (718 mm. long; tail 168 mm. against 500 and 130 mm. of the type). However, the body pattern is different. Boulenger describes the type as being "grayish olive above, sides with light edged black vertical bars; belly uniform yellowish white anteriorly, spotted and speckled with blackish posteriorly; lower surface of tail with some black spots." Sowerby's specimen is brownish above with a pattern of more or less rhombic spots of a more grayish color with broad margins of dark brown; these brown margins on the sides form with corresponding black margins coming up from the belly a distinct large X; the black ventral margins on the anterior third of the underside of the body extend more or less continuously across the belly enclosing a space of the yellowish white ground color, but further back each pair becomes consolidated into a broad black mark 3-4 ventrals wide either forming a continuous broad black ring across the belly, or alternat-

ing on the mid line with the corresponding pattern of the other side; on the body there are about 20 such black rings or half-rings; on the underside of the tail there are about 12, the larger ones being 5 to 6 pairs of subcaudals wide; on the posterior half of the underside the light interstices are mottled with brownish gray.

**NATRIX PERCARINATA (Boulenger)**

1899. *Tropidonotus percarinatus* BOULENGER, Proc. Zool. Soc. London, 1899, p. 163, pl. 17, fig. 2 (type locality, Kuatun, Fukien; type in Brit. Mus.; J. D. La Touche, collector).—WALL, Proc. Zool. Soc. London, 1903, p. 67 (Sikawei, Shanghai).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 354 (Ningpo mountains).

Boulenger's species was based on a single male specimen from Kuatun, Fukien. Since the original description appeared, specimens from near Shanghai have been referred to it by Doctor Wall and by Doctor Werner.

Two specimens which I refer to *N. percarinata* were collected by Mr. Graham at Si-gi-pin, Mount Omei, Szechwan. Compared with *N. aequifasciata* they have a less elongate snout with relatively shorter loreal and internasals; the supralabials are rather elongate, however, especially the three posterior ones. In both specimens the sixth supralabial is excluded from the eye by the subpostocular, but in No. 66635 the fourth touches the eye on both sides. The eye is rather large, the diameter exceeding the width of the frontal at the middle in this specimen. The frontal is very large in both, in No. 66635 with concave sides; parietals short, the suture between them equaling or shorter than the distance of frontal from tip of snout. The scale formula is as follows:

No. 65455 sc. 19; v. 140; a. 2; subc. . . . ; l. 9; oc. 1-4; t. 2+3.  
No. 66635 sc. 19; v. 139; a. 2; subc. 52; 1.<sup>9</sup>/<sub>10</sub>; oc. 1<sup>3</sup>/<sub>4</sub>; t. 2+3.

The dorsal scales are very strongly keeled, but the two outer scales are smooth and the third smooth or very weakly keeled.

In coloration the Mount Omei specimens differ considerably from *N. aequifasciata*. The upper side is nearly uniform gray with faint indications of dusky cross bars more or less continuous with the lateral markings which are more like those in the type of the species, except that they are pale in the middle. The underside, however, while lacking in the bold black cross blotches of the *N. aequifasciata*, nevertheless approach the latter in having indication of a similar pattern with the center of the cross bars faded out. In both specimens the labials are dark like the rest of the head without the blackish edges to the sutures which are characteristic of *N. annularis*.

It must be admitted that Boulenger's dictum that *N. percarinata* is closely allied to *N. annularis* is correct, but the characters, as indicated above, seem to justify its retention as a distinct form.

#### NATRIX PISCATOR (Schneider)

To the synonymy in Herpetology of Japan, 1907, p. 288, add:

*Tropidonotus piscator* STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 28 (Chekiang and Fukien); vol. 46, 1915, p. xiii (Swatow, Kwangtung).

No less than ten specimens from Fukien, viz., Nos. 64643, from Kuliang collected by C. R. Kellogg, Nos. 65381-4, from the Futsing district, Nos. 65404-7 and 66437, from Foochow, all by Sowerby, representing adults and young, testify to the uniformity of this species in the region mentioned. Curiously enough, these are the only specimens of true *N. piscator*, which the National Museum has received from China proper, with the exception of the type of *Amphiesma flavipunctatum* Hallowell, which is typical in scutellation and structure, a remark perhaps not superfluous in view of the various closely related forms which have been described since.

#### NATRIX NUCHALIS (Boulenger).

1889. *Tropidonotus swinhonis* GUENTHER, Ann. Mag. Nat. Hist. (ser. 6), vol. 4, Sept. 1889, p. 221 (Ichang, China) (not of 1868); in Pratt's To. Snows of Tibet, 1892, p. 241 (Ichang).

1891. *Tropidonotus nuchalis* BOULENGER, Ann. Mag. Nat. Hist. (ser. 6), vol. 7, 1891, p. 281 (type-locality, Ichang, Hupeh, China; cotypes in Brit. Mus.; A. E. Pratt, collector); Cat. Snakes Brit. Mus., vol. 1, 1893, p. 218, pl. 13, fig. 1 (Ichang).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 363.—WALL, Proc. Zool. Soc. London, 1903, p. 86.

*Natrix nuchalis* STEJNEGER, Herp. Japan, Bull. U. S. Nat. Mus. No. 58, 1907, p. 294.

Mr. Graham has sent no less than five specimens of this interesting species from various localities about Mount Omei, Szechwan. These specimens show very little individual variation, and it is particularly interesting to observe how constant is the consolidation of the long fifth supralabial. The nuchal groove is also well marked. The individual scale formulas are shown in the appended table.

United States National Museum No.	Sex and age	Locality	When col- lected	By whom collected		Scales	Ven- trals	Sub- caudals	Anal	Ocu- lars	Tem- porals
				D. C. Graham							
64431	Male	Mount Omei, Szechwan	1921								
65501	do	do	Aug., 1922		do						
65503	Female	Si-Gi-Pin, Szechwan	do		do						
65504	do	Shin-Kai-Si, Szechwan	July, 1923		do						
66645	Male										

**NATRIX STOLATA (Linnaeus)**

Synonymy in Herpt. Japan, 1907, p. 280, to which add:

*Tropidonotus (Amphiesma) stolatus* MUELLER, Verh. Naturg. Ges. Basel, vol. 6, pt. 4, 1878, pp. 603, 675 (Prov. Kwangtung, China, etc.).

*Tropidonotus stolatus* BOETTGER, Offenbach. Ver. Naturk., 24–25 Ber., 1885, p. 150 (Nien-hong-li near Hongkong).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 363.—STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 28 (Fukien); vol. 47, 1916, p. xiv (Ningtel, Fukien).

Four specimens, one from C. R. Kellogg (No. 64642), and three by Mr. Sowerby (Nos. 65390, 65397, 65403), all collected at or near Foochow and Yen-ping-fu, seem to indicate that this widely distributed species is not rare in Fukien.

**NATRIX TIGRINA LATERALIS (Berthold)**

Synonymy in Herp. Japan, 1907, p. 278, to which add:

*Tropidonotus tigrinus* SOWERBY, in Clark and Sowerby, Through Shén-Kan, 1912, p. 109 (Shansi; Shensi; Kansu).—BEDRIAGA, Wiss. Res. Przewalski Central-Asien Reis., Zool., vol. 3, sect. 1, pt. 4, June, 1912, p. 689 (Ordos).—STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 28 (Manchuria; Chihli; Shansi; Kiangsu; Chekiang; Fukien); vol. 47, 1916, p. xiii (Chuchow, Anhui; Paikuhsian, Shansi; Changning, Kiangsi); vol. 50, 1919, p. xv (Kihungshan, S. Honan); p. xvi (Weihsien).—GEE, Journ. N. China Asiat. Soc., vol. 50, 1919, p. 184 (Soochow).

*Amphiesma tigrinum* MOCQUARD, Bull. Mus. Hist. Nat., Paris, 1910, p. 149 (Lanchow, Kansu; Siganfu, Shensi).

*Tropidonotus tigrinus lateralis* NIKOLSKI, Fauna Rossij, Rept., vol. 2, 1916, p. 40 (Hongkong; Choi-shan, etc.)

In the Herpetology of Japan (p. 278) I expressed the opinion that while in the series of records then (1907) available, namely 62 *N. tigrina* and 20 *N. lateralis*, there was a small gap between the minimum total of ventrals plus subcaudals of 227 in the former, and the maximum of 224 in the latter, "it can hardly be doubted that a larger series would bridge it," and that

consequently it was thought best to use a trinominal appellation for one of them. The additional ten Chinese specimens obtained since then and listed below fail to bridge that gap. However, the slight gap between the subcaudals, namely, 66 minimum in *N. tigrinus* and 64 maximum in *N. lateralis* is bridged by no less than three specimens. Intergradation, as expected, has thus been established, and the use of a trinominal for the Chinese form fully justified.

An additional specimen No. 65942 from Suifu has been sent by Rev. D. C. Graham. The scale formula is: sc. 19; v. 153; a. 2; subc. 57; supral. 7; oc.  $2\frac{3}{4}$ ; t. 1+2. It will be noted that both Szechwan specimens have one anterior temporal. Moreover, they show the characteristic color and pattern of this subspecies; they have nothing to do with *Natrix handeli* (WERNER).

### Genus PSEUDOXENODON Boulenger

1890. *Pseudoxenodon* BOULENGER,  
Fauna Brit. India, Rept., p.  
340 (type, *P. macrops*  
(Blyth)).

#### PSEUDOXENODON MACROPS (Blyth)

1854. *Tropidonotus macrops*  
BLYTH, Journ. Asiat. Soc.  
Bengal, vol. 23, no. 3, p. 296  
(type-locality Darjiling, Himalaya; cotypes in Mus. Calcutta; Capt. W. S. Sherwill, collector). — *Pseudoxenodon macrops* BOULENGER, Fauna Brit. India, Rept., 1890, p. 340 (Eastern Himalaya, etc.); Cat.

List of specimens of *Natrix lateralis*

United States National Museum No.	Sex and age	Locality	When collected	By whom collected	Scale-rows	Ventrals	Anal	Sub-caudals	Labials	Oculars	Temporals	Altitude feet
63416		Suifu, Szechwan { Shansi, 20 miles southeast of Tai-yuan-fu.		D. C. Graham	19	144	1	41+	7	7	$2\frac{3}{4}$	1-2
49637		Shansi, Tai-yuan-fu		A. deC. Sowerby	19	156	2	66	7	7	—	—
49638		Shansi, 70 miles east of Yen-an-fu.		do	151	2	62	57	7	7	—	—
39336		Kansu, near Ho-shin-hsien		do	19	159	2	69	7	7	2-3	1-2
39337		Shensi, 50 miles east of Yen-an-fu.		do	19	151	2	60	7	7	2-3	4,000
39338		Yi-ling-fu, Shensi Chinli		do	19	157	2	71	7	7	2-3	4,000
39339		Imp. Hunting Grounds.		do	19	152	2	57	7	7	1-2	3,200
39317				do	19	152	2	57	7	7	1-2	4,000
60851				do	19	158	2	54	—	—	—	—

Snakes Brit. Mus., vol. 1, 1893, p. 270 (Himalaya, Khasi Hills, Burma).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 363 (part: Tatsienlu).—WALL, Proc. Zool. Soc. London, 1903, p. 87 (part: excl. Yunnan).—?STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 29 (Fukien); vol. 46, 1915, p. xiii (Kuling).—?MOCQUARD, Bull. Mus. Hist. Nat., Paris, vol. 3, 1897, p. 215 (Tcheku, Upper Mekong Valley, Yunnan).

1858. *Xenodon macropthalmus* GUENTHER, Cat. Colubr. Snakes Brit. Mus., p. 58 (type-locality; Khasya; Sikkim; Chikiang, China; cotypes in Brit. Mus.; J. Hooker, collector) (part only).—*Tropidonotus macropthalmus* GUENTHER, Rept. India, 1864, p. 262, pl. 22, fig. C (Khasya; Sikkim); Ann. Mus. Zool. St. Pétersbourg, vol. 1, 1896, p. 206 (Tatsienlu, Szechwan).

1871. *Tropidonotus sikkimensis* ANDERSON, Journ. Asiat. Soc. Bengal, vol. 40, pt. 2 (Nat. Hist.) No. 1, p. 17 (type locality, Darjeeling, Himalaya, 5,000 feet alt.; cotypes in Mus. Calcutta).

It may be well here to recapitulate briefly the history of the names of this and related forms, which Guenther at one time embraced under the term of *Xenodon macropthalmus* or *Tropidonotus macropthalmus*, and which originally also included specimens of *Tropidonotus himalayanus*.

The first segregation took place in 1864 when Guenther separated the Chikiang,<sup>49</sup> China, specimen from the Fortune collection, as *Tropidonotus dorsalis*,<sup>50</sup> in which he was followed by Boulenger 1890 and 1893<sup>51</sup> the two forms being distinguishable as follows:

- a*<sup>1</sup>. Strongly keeled scales in 19 rows, anteriorly; ventrals, 158–173; subcaudals, 55–75; no black lines on supralabial sutures—*P. macrops*.
- a*<sup>2</sup>. Feebly keeled or smooth scales in 17 rows, anteriorly; ventrals, 140; subcaudals, 51; supralabials with fine black lines at the sutures.

*P. dorsalis*.

In the former he included two specimens collected by A. E. Pratt at Kia-ting-fu, Szechwan, 7,070 feet above the sea, already recorded by Guenther<sup>52</sup> as *Tropidonotus macropthalmus*. But, in 1904, having received additional specimens from Szechwan and Yunnan, he described them as *Pseudoxenodon sinensis*.<sup>53</sup> Expressed in "key" form the characters relied upon to distinguish the three species are now (1904) as follows:

- a*<sup>1</sup>. Strongly keeled scales.
- b*<sup>1</sup>. Scales anteriorly in 19 rows; ventrals, 160–175; subcaudals, 55–75; supralabials, 8, without sutural black bars; anterior part of belly with dark brown spots—*P. macrops*.
- b*<sup>2</sup>. Scales in 19 or 20 rows on the middle of the body as well as on the neck; ventrals, 144–158; subcaudals, 55–67; supralabials usually 7 with sutural black bars; anterior part of belly without dark brown spots—*P. sinensis*.

<sup>49</sup> This, I take it, is the locality in the province of Hupeh; Doctor Werner regards it as equivalent to "Tschekiang," the province of Chekiang.

<sup>50</sup> Rept. Brit. India, 1864, p. 263.

<sup>51</sup> *Pseudoxenodon dorsalis* BOULENGER, Cat. Snakes Brit. Mus., vol. 1, 1893, p. 271, pl. 17, fig. 2.

<sup>52</sup> In Pratt's To Snows of Tibet, 1892, p. 241.

<sup>53</sup> Ann. Mag. Nat. Hist., ser. 7, vol. 13, Feb. 1904, p. 134.

*a<sup>2</sup>.* Scales feebly keeled on the back, smooth on the sides, in 17 rows anteriorly and 15 around the middle of the body; ventrals, 140; subcaudals, 51; supralabials, 8, with fine black lines at the sutures; belly with large brown spots anteriorly----- *P. dorsalis.*

Accordingly, *P. sinensis* is like *P. macrops* in the number and keeling of scales, but in number of ventrals and coloration it agrees with *P. dorsalis*. It differs from both in the number of supralabials being usually seven against eight in the other two.

It will be noted that the characters assigned to *P. macrops* are derived from 11 specimens from the Himalayas and Burma; that *P. dorsalis* rests on one specimen presumably from the middle Yangtse; and that five specimens from Szechwan and Yunnan furnish the scale formulas for *P. sinensis*. In addition to the latter Barbour has recorded<sup>54</sup> two specimens, one from Laolingkung, western Szechwan, at 10,300 feet altitude, and one from Yunnanfu, at 6,000 feet, which "come within the range of variation which Boulenger cites for the five previously published specimens". Their ventrals therefore presumably fall within 144–158 with seven supralabials.

In view of the above it is exceedingly puzzling to receive from Rev. D. C. Graham a specimen (No. 66535) collected 50 miles west of Tatsienlu which structurally agrees with *P. macrops* but in color matches *P. sinensis* from the same region. Its scale formula is as follows: sc. 19 (neck and middle, strongly keeled); v. 168; a. 2; subc. 74; l. 8; oc. 1-3; t. 2+3. The coloration is quite characteristic with heavy black sutures to the supralabials, a black chevron mark on the nape, and no spots on the anterior portion of the belly.

With 8 labials and 168 ventrals I do not feel at liberty to dissociate this specimen from *P. macrops*. On the other hand, with the records of 11 specimens of *P. macrops* showing a constant scale formula concomitant with a consistent geographic distribution and 7 specimens of *P. sinensis*, equally constant and consistent, I do not feel justified in reducing the latter to a synonym of the former. It may be, that in the Tatsienlu region the two forms intergrade physically as well as geographically.

#### PSEUDOXENODON MACROPS SINENSIS (Boulenger)

1892. *Tropidonotus macrophthalmus* GUENTHER, in Pratt's To Snows of Tibet, p. 241 (Kiating fu, Szechwan; not of 1858).

1904. *Pseudoxenodon sinensis* BOULENGER, Ann. Mag. Nat. Hist. (ser. 7), vol. 13, Feb. 1904, p. 134 (type-locality, Yunnan fu, Szechwan; types in Brit. Mus.; J. Graham, collector).

Since the account of *Pseudoxenodon macrops* was set in type, the museum has received a specimen (No. 67816) collected by Rev. D. C. Graham at Wenchwan, on the road to Sungpan, Szechwan, which is typical *P. sinensis* in coloration and in the number of ventrals, but with a larger number of subcaudals than recorded for this form

<sup>54</sup> Mem. Mus. Comp. Zoöl., vol. 40, no. 4, 1912, p. 131.

and having seven supralabials on one side and eight on the other. It goes a long way to demonstrate the intergradation of the two forms and justifies the use of the trinominal. It has the following scale formula: Sc. 19; v. 149; a. 2; subc. 70; supral. 7–8.

#### Genus TAPINOPHIS Boulenger

1899. *Tapinophis* BOULENGER, Proc. Zool. Soc. London, 1899, p. 164 (monotype, *T. latouchii* BOULENGER).  
 1909. *Cantonophis* WERNER, Jahresh. Ver. Naturk. Württemberg, 1909, p. 57 (monotype, *C. praefrontalis* WERNER).

#### TAPINOPHIS LATOUCHII Boulenger

1899. *Tapinophis latouchii* BOULENGER, Proc. Zool. Soc. London, 1899, p. 164, pl. 18, figs. 1–1c (type locality, Kuatun, Fukien, China; type in Brit. Mus.; J. D. La Touche, collector).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 363 (Kuatun, Fukien).—WALL, Proc. Zool. Soc. London, 1903, p. 87 (China).  
 1909. *Cantonophis praefrontalis* WERNER, Jahresh. Ver. Naturk. Württemberg, 1909, p. 57 (type-locality, Canton, China; type in Mus. Stuttgart).

A single specimen of this very rare and interesting snake (No. 65698) collected at Kuliang, Foochow, on July 25, 1919, has been forwarded by Mr. Sowerby. The specimen is a male, 388 mm. long, tail 80 mm., has 17 scale rows, 165 ventrals, 59 pairs of subcaudals. The only essential point in which it differs from the type is the undivided anal, though the ventral immediately in front of it is divided. It is also slightly abnormal in having nine supralabials on the right side, with the sixth labial only touching the eye, while on the left side there are ten supralabials, sixth and seventh entering eye; the lower postocular is larger and the last three supralabials longer; the single anterior temporal is longer, followed by two smaller ones only half as long. In most other respects it agrees perfectly with Boulenger's original description and figure. The color is nearly uniform dark above, including the labials, and there is no black streak along the side, but the outer scale row is nearly entirely light like the underside, and the scales of the next row have a pale median area and tip. The underside of the tail has no black median streak at the base.

#### Genus TRIRHINOPHOLIS Boulenger

1893. *Trirhinopholis* BOULENGER, Cat. Snakes Brit. Mus., vol. 1, p. 419 (monotype, *T. nuchalis* BOULENGER).

#### TRIRHINOPHOLIS STYANI Boulenger

1899. *Trirhinopholis styani* BOULENGER, Proc. Zool. Soc. London, 1899, p. 164, pl. 18, figs. 2–2a (type locality, Kuatun, Fukien, China; cotypes in Brit. Mus.; J. D. La Touche, collector).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 364 (Kuatun, Fukien).—WALL, Proc. Zool. Soc. London, 1903, p. 88 (China).—STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 29 (Fukien; Mokanshan, Chekiang); vol. 46, 1915, p. xiii (Kuling).

Of this rare snake Sowerby has sent in one specimen (No. 66434) from Fuchow, Fukien, consequently not far from the type locality, while Graham collected not less than ten specimens, as listed below, at Mount Omei and vicinity, Szechwan. This is rather surprising in view of the fact that the species has been found by no other collector so far in the interior. This series throws considerable light on the individual variation of the species of which formerly only two specimens were on record. As a whole the Szechwan specimens have a slightly shorter head than the one from Fukien before me, but the actual measurements afford no tangible character for separation, and the scale formulas are absolutely identical, and with one exception remarkably uniform, the ventrals in the males ranging between 109 and 116, in the females between 113 and 117, while the subcaudals run respectively 29–30 and 22–26. The one conspicuous exception is the presence of a well developed loreal on both sides in three specimens. In this connection it will be remembered that the type species of the genus, *Trirhinopholis nuchalis* Boulenger, from the mountains of Burma, is also characterized by the presence of a loreal.

*List of specimens of Trirhinopholis styani*

United States National Museum No.	Sex and age	Locality	When collected	By whom collected	Scale rows	Ven- trals	Anal	Sub- caudals	Loreal	Ocu- lars	Tem- porals	Supra- labials
64427	Male, adolescent--	Mount Omei, Szechwan--	15	Rev. D. C. Graham --	109	1		30	1	1-2	2+2	6
64429	Female, adoles- cent.	Mount Omei, Shin Kai Si	15	do	114	1		18	0	1-2	2+2	6
64430	do				15	116	1	22	0	1-2	2+2	6
64436	Juvenile--				15	113	1	24	0	1-2	2+2	6
65456	Male, adolescent--	Mount Omei--			15	110	1	29	0	1-2	2+2	
65502	Female, adoles- cent.	do			15	118	0	22	0			
65505	do				15	117	1	16	1	1-2	2+2	6
65506	Male, adolescent--	Mount Omei, Shin Kai Si			15	110	1	30	1	1-2	2+2	6
66534	{ Female, adoles- cent.	do			15	117	1	26	0	{ 1-2 1-1 }	2+2	6
66636	Juvenile--	Mount Omei--			15	117	1	26	0	1-2	2+2	6
66434	Male, adolescent--	Foochow, Fukien--		A. deC. Sowerby --	15	116	1	29	0	1-2	2+2	6

In the arrangement of the temporals there is considerable variation, the large lower first temporal reaching or not reaching the lower postocular. In all, the first pair of lower labials are small and widely separated, the first pair of chin shields being broadly in contact with mental. The coloration is fairly constant, the markings, especially on the neck and labials being more pronounced in the young. The dark nuchal blotch has mostly the same arrow-head shape as in *T. nuchalis*. The characteristic black spot on the rostral is semicircular.

#### ACHALINUS SPINALIS Peters.

Synonymy in Herpetology of Japan, 1907, p. 297, to which add:

*Achalinus spinalis* STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 29 (Taichowfu, Chekiang); vol. 46, 1915, p. xiii (Kuling).

1889. *Achalinus rufescens* GUENTHER, Ann. Mag. Nat. Hist., ser. 6, vol. 4, Sept. 1889, p. 220 (Ichang, China) (not of Boulenger, 1888); in Pratt's To Snows of Tibet, 1892, p. 240 (Ichang).

1893. *Achalinus braconnieri* BOULENGER, Cat. Snakes Brit. Mus., vol. 1, 1893, p. 309 (Ichang) (not of Sauvage, 1877?).—WALL, Proc. Zool. Soc. London, 1903, p. 88.

1910. *Cochalinus aspinalis* RHUMBLER, Zool. Anz., vol. 34, Dec. 20, 1910, p. 468 (substitute name).

A single halfgrown specimen (No. 66433) from Foochow, Fukien, by Sowerby, seems to prove that Doctor Wall (1903) and myself (1907) were correct in suspecting the distinctness of Boulenger's Chinese *A. braconnieri* from the Japanese species. The color distinction pointed out in the Herpetology of Japan (p. 296), as "the only feature which *thus far* offers a character by which to distinguish the two forms" falls to the ground, as Mr. Sowerby's Fukien specimen has a very distinct black dorsal line and a similar line on the subcaudals, the typical pattern of *A. spinalis*. The scale formula of this interesting specimen is as follows: sc. 23; v. 171; a. 1; subc. 46; oc. 0—0; t. 2+2; l. 6. Internasals are very much shorter than prefrontals, and the chin shields are two on one side and three on the other.

The question whether the Ichang specimens, identified by Boulenger with Sauvage's *Ophielaps braconnieri*, from eastern Kiangsi,<sup>55</sup> really belong to that species is still an open one. His diagnosis certainly does not fit any of the other specimens referred to it.

#### ENHYDRIS CHINENSIS (Gray)

1842. *Hypsirhina chinensis* GRAY, Zool. Misc. (p. 66) (type locality, China; type in Brit. Mus.; J. R. Reeves, collector).—GUENTHER, Rept. Brit. India, 1864, p. 283 (China).—STEINDACHNER, Novara Exped., Rept., 1867, p. 68 (Hongkong).—MUELLER, Verh. Naturf. Ges. Basel, vol. 6, pt. 4,

<sup>55</sup> See Herp. Japan, 1907, pp. 295–296.

1878, p. 605 (Chong-lok and Silong, Kwangtung prov.).—BOETTGER, Offenbach. Ver. Naturk., 24–25 Ber., 1885, p. 123, p. 151 (Canton).—BOULENGER, Cat. Snakes Brit. Mus., vol. 3, 1896, p. 8, pl. 1, fig. 2 (China; Ichang; Hainan).—WALL, Proc. Zool. Soc. London, 1903, p. 94.—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 366.

1861. *Hypsirhina dussumieri* FITZINGER, Sitz. Ber. Akad. Wiss., Wien, Math. Nat. Cl., vol. 42, 1861 (p. 406) (Hongkong) (not *Eurostus dussumieri* DUMÉRIL and BIBRON).

1914. *Hypsirhina sinensis* STANLEY, Journ. N. China Asiat. Soc., vol. 45, p. 30 (Fukien) (emendation); vol. 47, 1916, p. xiii (Changning, Kiangsi).

Two specimens from Fukien have been received from Mr. Sowerby, namely, No. 65388 from the Futsing District, and No. 66430, from Foochow. With the latter are two well-developed embryos the color of which is as follows: Ground color pale drab gray with six series of dusky spots: a lower one on angle of each ventral and basal half of first scale row; a lateral series of larger more distinct spots on fifth and sixth or seventh and eighth row; and a median double series on the two scale rows on each side of the vertebral row; the spots form continuous lines on the neck, the median series united into a zigzag band; a dusky band from rostral through eye almost confluent with the lateral neck band.

#### **ENHYDRIS PLUMBEA (Boie)**

For synonymy see Herpetology of Japan, 1907, p. 300, to which add:

*Hypsirhina plumbea* STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 30 (Fukien).

Of this widely distributed water snake we have now nine specimens collected by Sowerby in Fukien, namely, two from the Futsing District (Nos. 65386–7), one from near Yenpingfu (No. 65391) and six from Foochow (Nos. 65399–402; 66431–2). C. R. Kellogg also sent us one from Kuliang (No. 64645), and Prof. C. Ping another (No. 66855) from Wenchow, Chekiang:

#### **ENHYDRIS BENNETTII (Gray)**

No additional specimen has come to the National Museum since the publication of the Herpetology of Japan, 1907 (p. 307), when a specimen, presumably from Hongkong, was described and figured (figs. 263–265).

#### **ELAPHE RUFODORSATA (Cantor)**

For synonymy see Herpetology of Japan, 1907, p. 310, to which add:

*Coluber rufodorsatus* STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 28 (Quixan; Fukien; Chekiang; Kiangsu; Shaweishan Island and Shanhakwan); vol. 47, 1916, p. xii (Chuchow, Anhui).—GEE, Journ. N. China Asiat. Soc., vol. 50, 1919, p. 184 (Soochow).

*Elaphe rufodorsata* NIKOLSKI, Fauna Rossij, Rept., vol. 2, 1916, p. 121 (Khingan Mts. etc.).

Of this widely distributed snake which Doctor Stanley says is found practically all over China, the National Museum has received

three specimens from Mr. Sowerby, two collected at Tientsin and one at Hangchow, Chekiang, consequently not far from the type locality of the species. The scale formulas of these specimens are as follows:

U. S. Nat. Mus. No. 52342, fem. ad., Tientsin, sc. 21; v. 177; a. 2; c. 52; 1.7; c. 2-2; t. 2+3.  
U. S. Nat. Mus. No. 52342, fem. ad., Tientsin, sc. 21; v. . . . ; a. 2; c. 57; 1.7; oc. 1-2; t. 2+3.  
U. S. Nat. Mus. No. 66463, fem. ad., Hangchow, sc. 21; v. 176; a. 2; c. 52; 1.7; oc. 1-2; t. 1+ $\frac{2}{3}$ .

#### ELAPHE SCHRENCKII Strauch

Synonymy in Herpetology of Japan, 1907, p. 313, to which add:

*Coluber schrenckii* STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 28 (Manchuria, near Sungari Riv.).—*Elaphe schrenckii* NIKOLSKI, Fauna Rossij, Rept., vol. 2, 1916, p. 141 (Khingan Mts., Ussuri, etc.).  
1916. *Coluber anomalous* BOULENGER, Ann. Mag. Nat. Hist., ser. 8, vol. 17, March, 1916, p. 243 (type locality, Chihfeng, N. E. Chili, China; type in Brit. Mus.; A. L. Hall, collector).

Three specimens have been received from Mr. Sowerby of this somewhat variable snake which apparently reaches a considerable size. One of the specimens is an adolescent male taken in southern Manchuria on the Yalu River about 180 miles from its mouth. Its colors are dark and contrasted, the blackish pattern standing out quite distinct, especially on the ventrals. The two adults, from the Imperial Huntington Grounds in Chilili, 65 miles NE. of Peking, are nearly uniform dark grayish brown above, with indication of the blackish blotches near the posterior end, and pale underside with indistinct brownish-gray mottling. The adolescent specimen lacks the subpreocular on both sides and has a divided anal; the adults have the subpreocular, but in both the anal is single.

From Chifeng, a locality due east from and not more distant than 65 miles from the Imperial Hunting Grounds, Boulenger has described a single specimen as *Coluber anomalous* which he says can only be compared with *C. schrenckii* but differs in the number of upper labial shields (seven against eight in *E. schrenckii*), in the subcaudals being mostly single, and in other points of minor importance. In the Herpetology of Japan (p. 315) I have enumerated one specimen, with seven labials on one side and eight on the other, and one with six labials on one side and seven on the other. With regard to the subcaudals I call attention to the fact that one of Sowerby's Imperial Hunting Grounds specimens (No. 60849) has about ten unpaired subcaudals, and also to Strauch's mention, as a curious anomaly, of a similar condition found only in some east Siberian and West Chinese specimens of *E. dione*. It would therefore seem that the presence of unpaired subcaudals is more or less of a local anomaly among members of the genus *Elaphe* in this region.

*List of specimens of Elaphe schrenckii*

United States National Museum No.	Sex and age	Locality	When collected	By whom collected	Scales	Ven-trals	Anal	Sub-caudals	Labials	Ocu-lars	Tem-porals
52340	Male, adolescent	South Manchuria, Yalu River		A. deC. Sowerby-----	23	211	2	68	8	1½	2+4
60849	Female, adoles-cent.	Chili, Hsin Lung Shan	Aug. 17	do-----	23	218	1	66	8	2-2	½+3
60850	Male, adolescent	do-----	do-----	do-----	23	215	1	70	8	2-2	2+3

<sup>a</sup> Part single.*List of specimens of Elaphe dione*

United States National Museum No.	Sex and age	Locality	When collected	By whom collected	Scales	Ven-trals	Anal	Sub-caudals	Labials	Oculars	Tem-porals
39318	{ Female, adoles-cent. Male, adolescent	Shensi, Yu-ling-fu----- Shansi, Taiyuanfu----- do----- Male, adolescent	Nov. 19, 1908 Oct. 17, 1911 Sept. 28, 1911 do-----	A. deC. Sowerby----- do----- do----- do-----	25 25 25 25	191 188 180 185	2 2 2 2	67 67 73 72	8 8 8 8	2-½ 2-2 2-2 2-2	2+3
49639	Juvenile	S. Manchuria, Yalu Riv	do-----								
49641											
52338											

*List of specimens of Elaphe taeniurus*

United States National Museum No.	Sex and age	Locality	When collected	By whom collected	Scales	Ven-trals	Anal	Sub-caudals	Labials	Oculars	Tem-porals
46519	Male, adolescent	Shanghai-----		D. C. Jansen-----	23	242	2	107	8	1-2	½+3
63490	Juvenile	Suifu, Szechwan-----		D. C. Graham-----	25	245	2	112	9	2-2	2+3
63595	do-----	do-----		do-----	25	255	2	116	8	2-2	2+3
66457	do-----	Hangchow, Chekiang-----		A. de C. Sowerby-----	25	227	2	96	8	2-2	2+4
66634	do-----	Long Kong, Tatsienlu, Szechwan, 11,000 feet altitude.	July 10, 1923	D. C. Graham-----	23	234	2	111	9	2-2	2+3

**ELAPHE DIONE (Pallas)**

Synonymy in Herpetology of Japan, 1907, p. 315, to which add:

*Coluber (Elaphis) dione* STEINDACHNER, Wiss. Erg. Reise Szechenyi Ost-Asien, vol. 2, 1898, p. 506 (Prov. Szechwan).

*Coluber dione* BEDRIAGA, Wiss. Res. Przewalski Central-Asien Reis., Zool., vol. 3, sect. 1, pt. 4, June, 1912, p. 696, p. 764 (Ordos; Kansu, etc.).—SOWERBY, in Clark and Sowerby, Through Shen-Kan, 1912, p. 110, pl. (Shensi; Shansi).—STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 28 (Quinsan, Chinkiang, Honan, Shantung, Peking and Chinwangtao); vol. 47, 1916, p. xiii (Paikusian, Shansi; Chuchow, Anhui).—GEE, Journ. N. China Asiat. Soc., vol. 50, 1919, p. 184 (Soochow).

*Elaphe dione* NIKOLSKI, Fauna Rossij, Rept., vol. 2, 1916, p. 122 (Khingan, Ordos, Kansu, etc.).

1910. *?Zamenis pellioti* MOCQUARD, Bull. Mus. Hist. Nat., Paris, 1910, p. 150 (type-locality, Lanchowfu, Kansu; type in Paris Mus.; Dr. Louis Vaillant, collector).

Four specimens collected by Mr. Sowerby in northern China and Manchuria are typical and fall within the known boundaries of the species both in variation and geographical distribution. The Yalu River specimen is unusually dark and the spots large. For list of specimens see page 82.

**ELAPHE TAENIURUS Cope**

For synonymy see Herpetology of Japan, 1907, p. 319, to which add:

*Coluber (Elaphis) taeniurus* STEINDACHNER, Wiss. Erg. Reise Szechenyi Ost-Asien, vol. 2, 1898, p. 507 (Prov. Szechwan).

*Elaphe taeniurus* BARBOUR, Mem. Mus. Comp. Zoöl., vol. 40, no. 4, Aug. 1912, p. 129 (Laolingkung, 10,300 feet alt., west Szechwan).—NIKOLSKI, Fauna Rossij, Rept., vol. 2, 1916, p. 139 (Possiet Bay).

*Coluber taeniurus* STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 27 (Shanghai; Soochow, Hangchow, Chinkiang, Anhui, and Fukien); vol. 46, 1915, p. xiii (Kuling); p. xiv (Yaochow, Sze); vol. 47, 1916; p. xiii (Siangtan, Hunan); p. xiv (Suining, Szechwan).—GEE, Journ. N. China Asiat. Soc., vol. 50, 1919, p. 184 (Soochow).

1905. *?Coluber vaillanti* MOCQUARD, Bull. Mus. Hist. Nat., Paris, 1905, (p. 76) (type-locality, Cao Bang, Tonkin, near Chinese frontier; type in Paris Mus.; Dr. Louis Vaillant, collector); 1910, p. 3, fig. 2.

The scale formulas of the five specimens of this species recently received and recorded on page 82 fall well within the limits established in the Herpetology of Japan (p. 319) for the typical form, except that the maximum for subcaudals is raised to 116 from 111. They also fall within the known geographical limits of the species as restricted by me.

## ELAPHE MANDARINUS (Cantor)

1840. *Coluber mandarinus* CANTOR, Zool. Chusan (pl. 12) (type locality, Chusan, China; type in Brit. Mus.; Dr. Cantor collector); Ann. Mag. Nat. Hist., vol. 9, 1842 (p. 483).—GUENTHER, Cat. Colubr. Snakes Brit. Mus., 1858, p. 91; Rept. Brit. India, 1864, p. 238, pl. 20, fig. H.—BOETTGER, Offenbach. Ver. Naturk., 24–25 Ber., 1885, p. 147 (Chusan).—BOULENGER, Cat. Snakes Brit. Mus., vol. 2, 1894, p. 42 (Chusan); Proc. Zool. Soc. London, 1899, p. 165 (Kuatun, Fukien).—WALL, Proc. Zool. Soc. London, 1903, p. 91.—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 364.—STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 28 (Kash-ing; Ningpo; Fukien); vol. 47, 1916, p. xiv (Fukien).—ANGEL, Bull. Mus. Hist. Nat., Paris, 1920, No. 2, p. 112 (Kweichow).

1903. ?*Coluber conspicillatus* WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, p. 357 (Hankow, China) (not of Boie.)

A young specimen (No. 64019) collected by C. H. Barlow at Moh-kan-shan, Chekiang province, was the first specimen of this handsome snake received by the National Museum, perfectly normal in scalation and coloration and well within the known geographic range of the species. Scale formula: sc. 23; v. 213; a. 2; subc. 20+; l. 7; oc. 1–2; temp. 2+3.

The receipt of a fine full grown male (No. 65497) from Rev. D. C. Graham collected at Shin-Kai-Si, Szechwan, on August 31, 1922, was therefore a distinct surprise, as it means a very great extension of the range of the species. The scale formula is as follows: sc. 23; v. 220; a. 2; subc. 70; l. 7; oc. 1–2; temp. 2+3. With regard to the temporals it is to be noted that the second row on one side in both specimens is considerably disarranged by breaking up and fusion. It is further to be noted that while it is doubtful whether the young specimen can be said to possess even an indistinct lateral ventral keel, in the adult specimen there is a very distinct, though obtuse, keel, thus bringing it close to *E. conspicillata*, to which it is undoubtedly related as first suggested by Guenther. Finally, the old specimen, contrary to what is the case in the Japanese species, shows the peculiar color pattern as distinct as the young specimen, except that the red ground color, judging from the appearance in alcohol, is much duller grayish brown, and the dorsal light lozenges are of the same tint as the brownish ground color.

## LIOPELTIS MAJOR (Guenther)

Synonymy in Herp. Japan, 1907, p. 338 to which add:

*Cyclophis major* GUENTHER, in Pratt's To Snows of Tibet, 1892, p. 241 (Kiukiang).

*Ablabes major* STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 27 (Yangtse Valley; Chekiang; Fukien); vol. 46, 1915, p. xiii (Kuling); vol. 47, 1916, p. xiii (Mokanshan).—GEE, Journ. N. China Asiat. Soc., vol. 50, 1919, p. 184 (Soochow).

*Liopeltis major* BARBOUR, Proc. New England Zoöl. Club, vol. 4, Nov. 1909, p. 69; Mem. Mus. Comp. Zoöl. Cambridge, vol. 40, no. 4, 1912, p. 130 (eight days journey northwest of Ichang).

Mr. Graham has extended the known limit of the green snake in the Yangtse valley, which previously was Ichang, by sending in three spec-

imens (Nos. 64426, 64428 and 66533) from the neighborhood of Mount Omei, at 4,400 feet altitude. While I was writing the Herpetology of Japan, the National Museum had no specimen from China except the type of Hallowell's *Herpetodryas chloris*, from Hongkong. There is now a splendid series of 13 additional specimens, from Fukien (Sowerby), Chekiang (C. H. Barlow), Hunan (Dr. Lewis R. Thompson) and Shanghai (D. C. Jansen), as listed below. The table also shows the remarkable uniformity of the scalation of this species. The most notable exception is No. 66533, an adult female from Mount Omei, which has three postoculars and an undivided anal, the latter being a character of the related species *Liopeltis doriae* (Boulenger), from the Kakhyan Hills and Assam.

All the specimens have a semidivided nasal as stated by Boulenger, and a reexamination of the type of *Herpetodryas chloris* has convinced me that it does not differ essentially from the others.

*List of specimens of Liopeltis major*

United States National Museum No.	Sex and age	Locality	When collected	By whom collected	Scales	Ventralis	Anal	Subcaudals	Labials	Oculars	Temporals
46520				D. C. Jansen Dr. Lewis R. Thompson	15	167	2	89	8	1-2	1+2
63194	Female, adolescent	Shanghai, China Southwestern part of Hunan Province.			15	165	2	85	8	1-2	1+2
63195	Male, adolescent		do		15	172	2	88	8	1-2	1+2
63196	Female, adolescent		do		15	163	2	86	8	1-2	1+2
63197			do		15	173	2	92	8	1-2	1+2
63198			do		15	166	2	85	8	1-2	1+2
64020	Male, adolescent	Moh Kan Shan, Chekiang			15	166	2	87	8	1-2	1+2
64021	Juvenile		do		15	167	2	87	8	1-2	1+2
64426	Male, adolescent	Mount Omei, Szechwan Shin-Kai-Si.	1921	D. C. Graham	15	173	2	81	8	1-2	1+2
64428	Female, adolescent	Mount Omei, Szechwan	do		15	171	2	84	8	1-2	1+2
65392		Yen-ping-fu, Fukien		A. de C. Sowerby	15	166	2	81	8	1-2	1+2
66436	Male, adolescent	Foochow, Fukien		do	15	161	2	80	8	1-2	1+2
66533	Female, adolescent	Shin-Kai-Si, Mount Omei, Szechwan	1923	D. C. Graham	15	167	1	80	8	1-3	1+2

## PTYAS KORROS (Schlegel)

To synonymy in Herpetology of Japan, 1907, p. 348, add:

*Zamenis korros* STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 27  
(Taichowfu; Chekiang; Fukien; Hainan).

Mr. Sowerby has sent six specimens from Fukien, of which one (No. 65385) is from Futsing, the others (Nos. 65395, 65410-65413) from Foochow.

MASTICOPHIS<sup>56</sup> SPINALIS Peters

For synonymy see Herpetology of Japan, 1907, p. 349 under *Zamenis spinalis*, to which add:

SOWERBY, in Clark and Sowerby, Through Shen-Kan, 1912, p. 110 (Kansu).—BEDRIAGA, Wiss. Res. Przewalski Central-Asien Reis., Zool., vol. 3, sect. 1, pt. 4, June 1912, p. 692 (Alashan; Ordos).—STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 27 (Chinwangtao and Peking); vol. 47, 1916, p. xiii (Tsangehow; Prikuhsian, Shansi).—NIKOLSKI, Fauna Rossij, Rept., vol. 2, 1916, p. 81 (Alashan; Ordos).  
1910. *?Psammophis schokari* MOCQUARD, Bull. Mus. Hist. Nat., Paris, 1910, p. 151 (Kucha, Sinkiang; oasis of Sachow (not of Forskål)).

Two specimens of this apparently rare though widely distributed snake have been sent by Mr. Sowerby. The first, No. 39335, was collected at Tai-pei-cheng, 50 miles west of Ching-yang-fu, Kansu, about 3,900 feet above the sea, on August 15, 1909. Its scale formula is as follows: sc. 17; v. 201; a. 2; subc. 84; l. 8; oc. 2-2; temp.  $\frac{1}{2}+2$ . The frontal is separated from preocular, and fourth and fifth labials enter the eye. Another, mutilated specimen (No. 59729) without definite locality, but bearing the collector's number 370, has 17 scale rows; eighth labials, fourth and fifth touching eye; two preoculars and two postoculars; temporals 2+3; frontal not in contact with preocular.

Whether the normal number of supralabials in this species is nine or eight, as mentioned in the Herpetology of Japan (p. 351), is still an open question. Noting that the Alashan and Ordos specimens examined by Bedriaga had eight supralabials, it becomes pertinent to inquire whether there may not be a northern form with eight supralabials and a southern one with nine. This is an admonition to place all the data relating to the individual specimens of this species on record.

<sup>56</sup> In view of the recent revival of the genus *Masticophis* by Professor Ortenburger and as Peters originally described the present species as *Masticophis spinalis*, I have retained this term without prejudice until further studies shall confirm the validity of this genus and establish the propriety of referring the present species to it. The genus *Masticophis* was instituted in 1853 by Baird and Girard, Cat. North Amer. Rept., pt. 1, Serp., p. 98, with *M. flagelliformis* as designated type.

## ZAOCYS DHUMNADES (Cantor)

For synonymy see Herpetology of Japan, 1907, p. 352, to which add:

STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 27 (Shanghai; Hang-chow; Sianfu, Fukien); vol. 47, 1916, p. xiii (Chuchow, Anhui); p. xiv (Kuling); vol. 50, 1919, p. xv (Hwaiyuan).—GEE, Journ. N. China Asiat. Soc., vol. 50, 1919, p. 184 (Soochow).

Of this grass snake, said by Wall and Stanley to be common about Shanghai, the National Museum had no specimen at the time of the publication of the Herpetology of Japan. Thanks to the thoughtfulness of D. C. Jansen we have now a fine adult male of typical coloration and with the typical number of two strongly keeled dorsal scale rows. It has 16 scale rows, 194 ventrals; 2 anals; 109 pairs of subcaudals; 8 supralabials; 2+2 temporals.

## ZAOCYS NIGROMARGINATUS (Blyth)

1854. *Coluber nigromarginatus* BLYTH, Journ. Asiat. Soc. Bengal, vol. 23, no. 3, p. 290 (type locality, vicinity of Darjiling, Himalaya; cotypes in Mus. Calcutta; Capt. W. L. Sherwill, collector).

*Zaocys nigromarginatus* GUENTHER, Rept. Brit. India, 1864, p. pl. 22, fig. B (Nepal; Sikkim; Khasia).—BOULENGER, Cat. Snakes Brit. Mus., vol. 1, 1893, p. 376 (Himalayas, Kasi Hills and Kakhyen Hills, upper Burma).

1858. *Coryphodon carinatus* GUENTHER, Cat. Col. Snakes Brit. Mus., p. 112 (type locality, Borneo, Himalaya, Chusan<sup>57</sup>; cotypes in Brit. Mus.) (part only; Khasia, Sikkim).

1867. *Coryphodon dhumnades* JAN, Icon. Ophid., livr. 23, pl. 4, fig. 1 (Himalaya) (not of Cantor, 1842).

*Zaocys dhumnades* GUENTHER, Ann. Mus. Zool. St. Pétersbourg, vol. 1, 1896, p. 205 (Lunganfu, Szechwan).

A series of six specimens, adult, adolescent, and young, collected by D. C. Graham in Szechwan, introduce this Himalayan species into the Chinese fauna as distinguished from the Chinese *Z. dhumnades*, for I have but little doubt that the specimen collected by Berezowski at Lunganfu and recorded by Guenther under the latter name is identical with Graham's specimens from Suifu and Mount Omei.

As will be seen from the list given below, the number of subcaudals is in excess of those typical of *Z. dhumnades*. In addition, the number of keeled rows is six in all the specimens, except the youngest one (No. 63414) in which only four scales are keeled, the same as in *Z. nigromarginatus*. Moreover, the color pattern, which is only plainly visible in the younger ones, is that of the latter species as distin-

<sup>57</sup> Restricted by Guenther in 1864, Rept. Brit. India, p. 256, to specimen *a* from Borneo.

guished from *Z. dhumnades*. One of the specimens, No. 63414, is abnormal in lacking the subpreocular on both sides, otherwise the scalation in Mr. Graham's series is normal and very uniform.

With the addition of the one occurring in Formosa, which turns out to be distinct,<sup>58</sup> we have now three forms of *Zaocys* with a single loreal, 16 scale rows and keeled median dorsals as follows:

*a<sup>1</sup>*. Two (rarely four) median rows of dorsal scales keeled; subcaudals 96–119 pairs.

*Z. dhumnades* (Cantor).

(Southern China: Fukien to Shanghai, and Yangtse valley to Kiukiang.)

*a<sup>2</sup>*. Six or four median rows of scales keeled; subcaudals, 117–144 pairs.

*b<sup>1</sup>*. Subcaudals, 140–144; a yellow vertebral stripe on anterior half of body.

*Z. oshimai* Stejneger.

(Formosa.)

*b<sup>2</sup>*. Subcaudals, 117–137; posterior two-thirds of body and tail with a broad black band on each side.

*Z. nigromarginatus* (Blyth).

(Himalayas to Burma and western Szechwan.)

<sup>58</sup> **ZAOCYS OSHIMAI**, new species.—1907. *Zaocys dhumnades* STEJNEGER, Herp. Japan, Bull. U. S. Nat. Mus., No. 58, 1907, p. 352 (part, Formosa) (not of Cantor 1842).—OSHIMA, Annot. Zool. Japan., vol. 7, pt. 3, Mar., 1910, p. 195 (Shushu Nanto, Formosa).

**Diagnosis.**—A single loreal; dorsal scales in 16 rows, (four or ?) six median ones keeled; subcaudals 140–144; coloration a yellow vertebral stripe on two median scales from neck, and a similar one on fifth and sixth scale rows, both disappearing on posterior half of body.

**Type locality.**—Urai, Island of Formosa.

**Type.**—U. S. Nat. Mus., No. 52267; Dr. Fred Baker, collector; November 18, 1914.

**Scale formula.**—Sixteen scale rows, 6 median ones keeled; 201 ventrals; 2 anals; 144 subcaudals; 8 supralabials; 2–2 oculars; 2 + 2 temporals.

**Remarks.**—This form is closely related to *Z. dhumnades* from the mainland opposite Formosa, having the same color pattern. The scutellation, however, is more like that of *Z. nigromarginatus*, except that the number of subcaudals is even greater than in the latter form.

In three specimens recorded by Dr. M. Oshima, in whose honor this snake is named, the ventrals were 195–197 and subcaudals 140–143. One of the specimens lacked the subpreocular, and another had abnormal temporals.

*List of specimens of Zaocys nigromarginatus*

United States National Museum No.	Sex and age	Locality	When collected	By whom collected	Scales	Ventrals	Anal	Subcaudals	Labials	Oculars	Temporals
63414	Juvenile	Suifu, Szechwan	Aug., 1920	D. C. Graham	16	198	2	117	8	1–2	2+2
63418	Male, adolescent	do	do	do	16	200	2	126	8	2–2	2+2
64432	Female, adolescent	Mount Omei, Szechwan	1921	do	16	195	2	112	8	2–2	{ 1+2 }
65498	Male, adolescent	do	do	do	16	194	2	123	8	2–2	2+2
65499	Female, adolescent	Suifu, Szechwan	do	do	16	197	2	119	8	2–2	2+2
66644	do	Shin-Kai-Si, Mount Omei, Szechwan	July, 1923	do	16	196	2	119	8	2–2	2+2

**HOLARCHUS FORMOSANUS (Guenther)**

For synonymy see Herp. Japan, 1907, p. 354 (exclusive of reference to *Simotes hainanensis* which is said to be a recognizable color form).

Mr. Sowerby has sent a typical example of this species from near Yenpingfu, Fukien (No. 65393) which has the following scale formula: sc. 19; v. 158; a. 1; subc. 47; lab. 8; oc. 2-2; temp. 1+2.

**HOLARCHUS VIOLACEUS (Cantor)**

1839. *Coronella violacea* CANTOR, Proc. Zool. Soc. London, 1839, p. 50 (type locality, Rungpore, Bengal).

*Simotes violaceus* BOULENGER, Fauna Brit. India, Rept., 1890, p. 312 (Bengal to Southern China); Cat. Snakes Brit. Mus., vol. 2, 1894, p. 222 (Bengal to southern China; Amoy; Hongkong).—WALL, Proc. Zool. Soc. London, 1903, p. 92 (mainland opposite Hongkong).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 365.—STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 27 (Hainan; Fukien).

*Holarchus violaceus* STEJNEGER, Herp. Japan, Bull. U. S. Nat. Mus. No. 58, 1907, p. 354

1864. *Simotes cinereus* GUENTHER, Rept. Brit. India, p. 215 (type locality, Cambodja; type in Brit. Mus.; Mr. Mouhot, collector).

1864. *Simotes swinhonis* GUENTHER, Rept. Brit. India, p. 215, pl. 20, fig. E (type locality, Amoy, China; types in Brit. Mus.; R. Swinhoe, collector).—MUELLER, Verh. Naturf. Ges. Basel, vol. 6, pt. 4, 1878, p. 595 (Lilong, Kwangtung).

1865. *Simotes multifasciatus* JAN, Icon. Gen. Ophid., livr. 12, pl. 4, fig. 2 (type locality?).

1871. *Simotes semifasciatus* ANDERSON, Journ. Asiat. Soc. Bengal, vol. 40, pt. 2, Nat. Hist., p. 16 (type locality, Naga Hills, Assam; cotypes in Ind. Mus., Calcutta).

1885. *Simotes swinhœi* BOETTGER, Offenbach. Ver. Naturk., 24-25 Ber., 1885, p. 146 (Lilong; Amoy) (emendation).

1895. *Holarchus dolleyanus* COPE, Proc. Acad. Nat. Sci. Philadelphia, 1894, p. 423, pl. 10, fig. 1 (type locality, Hainan; Rev. F. Gilman, collector).

A specimen (No. 65396) was collected by Mr. Sowerby at Foochow, Fukien, which has the following scale formula: sc. 17; v. 157; a. 1; subc. 37; lab. 8; oc. 2-2; temp. 2+2.

It will be noted that there are two well developed anterior temporals on both sides, but fourth and fifth supralabials enter the eye and in all other characters the specimen is a typical *H. violaceus*.

**DINODON RUFOZONATUM (Cantor)**

Synonymy, Herpetology of Japan, 1907, p. 358, to which add:

*Lycodon rufozonatus* STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 26 (Shanghai; Soochow; Wusich; Kiukiang; Tatung; Anhui; Szechwan; Fukien; Ningpo; Tsinanfu; Peking); vol. 47, 1916, p. xiii (Tsangchow); p. xiv (Kashing; Suining; Szechwan; p. xv (Kuling); vol. 48, 1917, p. xiii (Pingchiao Quarry).—GEE, Journ. N. China Asiat. Soc., vol. 50, 1919, p. 184 (Soochow).

To the known localities where this common and widely distributed snake occurs may be added southwestern part of Hunan (Nos. 63201-2, collected by Dr. Lewis R. Thompson) and Suifu, Szechwan (No. 63415 by Rev. D. C. Graham) and Hangchow, Chekiang (No. 66458 by A. de C. Sowerby). D. C. Jansen has also sent us two specimens from Shanghai (Nos. 46517-46518).

### Genus LYCODON Boie

1826. *Lycodon* BOIE, Ferussac's Bull. Sci. Nat., 1826, p. 238 (type, *Coluber aulicus* LINNAEUS).<sup>59</sup>  
 1830. *Ophites* WAGLER, Syst. Amph., p. 186 (monotype, *Lycodon subcinctus* BOIE).  
 1853. *Sphecodes* DUMÉRIL and BIBRON, Mém. Acad. Sci., Paris, vol. 23, p. 461, author's separate, p. 65 (monotype *S. albofuscus*).  
 1858. *Leptorhytaon* GUENTHER, Cat. Colubr. Snakes Brit. Mus., p. 205 (monotype, *Leptorhytaon jara*).  
 1858. *Tetragonosoma* GUENTHER, Cat. Colubr. Snakes Brit. Mus., p. 253 (monotype, *Lycodon effraenis* CANTOR).  
 1868. *Tytleria* THEOBALD, Cat. Rept. Asiat. Soc. Bengal Mus., (p. 66) (type, *T. hypsirhinoidea* THEOBALD).  
 1893. *Anoplophallus* COPE, Amer. Natural., 1893, p. 480; Trans. Amer. Philos. Soc., vol. 18, pt. 2, 1895, p. 216. (Type, *A. maculatus* COPE).

### LYCODON SUBCINCTUS Boie

1827. *Lycodon subcinctus* BOIE, Isis, 1827, p. 551 (type locality, Java).—BOULENGER, Cat. Snakes Brit. Mus., vol. 1, 1893, p. 359.—WALL, Proc. Zool. Soc. London, 1903, p. 88 (Hongkong).  
 1860. *Homalopsis buccatus* HALLOWELL, Proc. Acad. Nat. Sci. Philadelphia, 1860, p. 504 (Hongkong Island) (not of Linnaeus).  
 1884. *Elapoides annulatus* SAUVAGE, Bull. Philom. Paris, ser. 7, vol. 8, (p. 144) (type locality, Sumatra; type in Paris Mus.; P. Fauque, collector).  
 1895. *Anoplophallus maculatus* COPE, Trans. Amer. Philos. Soc., vol. 18, pt. 2, p. 216, pl. 26, fig. 2 (not *Megalops maculatus* HALLOWELL, 1860).

The National Museum has not received any additional material of this species, but I wish to place on record, U. S. Nat. Mus. No. 7359, which is the specimen mentioned by Hallowell (Proc. Acad. Nat. Sci. Philadelphia, 1860, p. 504) under the name “? *Homalopsis buccatus*” as collected “on the Island of Hong Kong, May, 1854,

<sup>59</sup> Type designation by Fitzinger, Neue Class. Rept., 1826, p. 29, p. 30. See Stejneger, Proc. U. S. Nat. Mus., vol. 38, 1911, p. 107.

by Mr. Brooke, of the North Pacific Exploration under command of Capt. John Rogers, U. S. N."

In connection with this specimen another error should be corrected. It is the same specimen which Cope introduced as the type of a new genus, *Anoplophallus*, to be known as *A. maculatus*, under the mistaken notion that it was the type of Hallowell's *Megalops maculatus*, which apparently has been lost. The blunder is manifest by examining Hallowell's description of the generic characters, among which "a frenal; two antoculars," etc., while Cope himself correctly (for *Lycodon subcinctus*) says "a long loreal and no preocular plate."

What Hallowell's *Megalops maculatus* from Tahiti really represents is still a mystery, but Cope's *Anoplophallus maculatus* is undoubtedly a synonym of *Lycodon subcinctus*.

#### LYCODON AULICUS (Linnaeus)

1758. *Coluber aulicus* LINNAEUS, Syst. Nat., ed. 10, vol. 1, p. 220 (type locality, "America"; type in Mus. Adolph. Fred.); ed. 12, vol. 1, 1766, p. 381.—ANDERSON, Bih. Svensk. Vet. Akad. Handl., vol. 24, pt. 4, no. 6, 1899, p. 16 (type).

*Lycodon aulicus* FITZINGER, Neue Classif. Rept., 1926, p. 57.—STEINDACHNER, Reise Novara, Rept., 1867, p. 74 (Amoy).—BOETTGER, Offenbach. Ver. Naturk., 26–28 Ber., 1888, p. 84 (Hongkong).—BOULENGER, Cat. Snakes Brit. Mus., vol. 1, 1893, p. 352.—WALL, Proc. Zool. Soc. London, 1903, p. 88 (Hongkong? Amoy?).—WERNER, Abh. Bayer. Akad. Wiss., II Kl, vol. 22, pt. 2, 1903, p. 364 (Hongkong).—STEJNEGER, Herp. Japan, Bull. U. S. Nat. Mus., no. 58, 1907, p. 358.

The doubt as to the occurrence of this species in southern China voiced by Doctor Wall in 1903 has not been entirely removed, though I still think that the specimen in the Hongkong Museum credited to Formosa is in reality from Hongkong,<sup>60</sup> if Chinese at all.

#### CALAMARIA SEPTENTRIONALIS Boulenger

1888. *Calamaria quadrimaculata* GUENTHER, Ann. Mag. Nat. Hist. (ser. 6), vol. 1, 1888 (p. 165) (Mts. N. of Kiukiang) (not of DUMÉRIL and BIBRON, 1854); in Pratt's To Snows of Tibet, 1892, p. 239.

1890. *Calamaria septentrionalis* BOULENGER, Proc. Zool. Soc. London, 1890, p. 34 (type locality, Kiukiang and Hongkong, China; cotypes in Brit.

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<sup>60</sup> See Herp. Japan, p. 358.

Mus.; A. E. Pratt, collector); Cat. Snakes Brit. Mus., vol. 2, 1894, p. 349, pl. 20, fig. 1 (Mts. N. of Kiukiang, Hongkong, Chusan Archip., and mainland opposite); Proc. Zool. Soc. London, 1899, p. 165 (Kuatun, Fukien).—WALL, Proc. Zool. Soc. London, 1903, p. 93.—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 365.—STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 26 (Wuhu; Weichow; Fukien).

The series of seven specimens now in the National Museum, thanks to Dr. Louis R. Thompson, C. H. Barlow, and A. deC. Sowerby extends the known range of this species to southwestern Hunan. It consequently embraces all of southeastern China south of the Yangtse and up that river as far as Kiukiang.

Our series shows great uniformity both in structure and color. The scale formulas may be seen from the table below, which show no deviation from those given previously by Boulenger for ten specimens, except that the maximum for the subcaudals of the males is raised from 17 to 18. The snout in all is blunt, with the rostral barely visible from above. The coloration in all the specimens agrees closely with the figure given by Boulenger.

It will thus be seen that the characters relied upon in the Herpetology of Japan (p. 376) for the separation of *Calamaria berezowskii*, from Szechwan and Formosa, are fully confirmed by the present series of *C. septentrionalis* to which it is probably intimately related. The curious fact that several of the Formosan species show greater similarity to species from Szechwan and the Himalayan region than to those of the intermediate region is thus emphasized.

*List of specimens of Calamaria septentrionalis*

United States National Museum No.	Sex and age	Locality	When collected	By whom collected	Scale rows	Ven- trals	Anal	Sub- caud- als	Supra- labials
63191	Female, adoles- cent.	Southwest part of Hunan Province, China	Dr. Lewis R. Thompson	do	13	171	1	9	4
63192	Male, adolescent	do	do	do	13	154	1	17	4
63193	do	do	do	do	13	158	1	17	4
64016	do	Moh Kan Shan, Chekiang, China	C. H. Barlow	do	13	161	1	18	4
64017	Female, adoles- cent.	do	do	do	13	174	1	10	4
64018	do	do	do	do	13	174	1	10	4
65414	Male, adolescent	Foochow, Fukien	A. deC. Sowerby	do	13	156	1	18	4

## Family BOIGIDAE

### PSAMMODYNASTES PULVERULENTUS (Boie)

For synonymy see Herpetology of Japan, 1907, p. 383, to which add:

*Psammodynastes pulverulentus* STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 29 (Hainan; Fukien).

In 1910 when discussing the relationship of the Formosan reptilian fauna to that of the Philippine archipelago<sup>61</sup> I stated that there were only two species common to Formosa and the Philippines which had not yet been collected in Chinese territory, namely *Dasia smaragdina*, a skink of wide distribution and likely to have been introduced into Formosa by human agency, the other being the snake here under consideration. With regard to *P. pulverulentus* I then remarked that its discovery within the limits of China would not cause surprise as its known distribution includes Assam, Sikkim, and the Shan states. This prophecy was fulfilled within four years, for in 1914 Mr. Stanley recorded specimens both from north and south Fukien, and from Hainan.

Further confirmation is had through a specimen (No. 65394) collected by Mr. Sowerby near Yenpingfu, Fukien.

## Family AMBLYCEPHALIDAE

### AMBLYCEPHALUS CHINENSIS Barbour

1912. *Amblycephalus chinensis* BARBOUR, Mem. Mus. Comp. Zoöl., vol. 40, no. 4, August 1912, p. 132, pl. 2, fig. 1 (type-locality, Luluping, western Szechwan; type, Mus. Comp. Zoöl., no. 7326; W. R. Zappey).—STANLEY, Journ. N. China Asiat. Soc., vol. 47, 1916, p. xiii.

A specimen with a badly mutilated head, (no. 67815) was collected by Mr. Graham 50 miles northwest of Kuanshien, Szechwan, on the road to Sungpan, 1924. The scale formula is as follows: sc. 15; v. 176; a. 1; subc. 74. The head is so badly crushed that the separate shields can not always be made out with certainty.

## Family ELAPIDAE

### NAJA NAJA ATRA (Cantor)

For synonymy see Herpetology of Japan, 1907, p. 394, to which add:

*Naia naia atra* BARBOUR, Proc. New England Zoöl. Club, vol. 4, 1909, p. 72 (Hainan).—STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 30 (Taichowfu, Wenchow, Chekiang; Kuatun and Ningteh, Fukien; Lam-mock Islands); vol. 47, 1916, p. xiv (Pagoda Anchorage, Foochow); vol. 50, 1919, p. xv (Hongkong).

A head (No. 16284) of a specimen from Wenchow, Chekiang, by Dr. D. J. MacGowan, and an adult (No. 63190) collected by Dr.

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<sup>61</sup> Proc. U. S. Nat. Mus., vol. 38, 1910, p. 94.

Lewis R. Thompson in the southwestern part of Hunan are now in the collection in addition to the Hongkong specimen listed in the Herpetology of Japan. The scale formula of the Hunan specimen is as follows: sc. on neck 25, on body 21; v. 167; a. 1; c. 49; l. 7; oc.  $1\frac{2}{3}$ ; temp. 2+2. It will be seen that the sum of ventrals and subcaudals is 216, exactly the average of the nine specimens previously listed by me.<sup>62</sup>

**BUNGARUS MULTICINCTUS** Blyth

For synonymy see Herpetology of Japan, 1907, p. 397, to which add:

*Bungarus caeruleus multicinctus* BARBOUR, Mem. Mus. Comp. Zoöl., vol. 40, no. 4, 1912, p. 131 (Ichang, Hupeh).

*Bungarus semifasciatus* STANLEY Journ. N. China Asiat. Soc., vol. 45, 1914, p. 30 (South China).

*Bungarus candidus* STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 30 (Chekiang and Fukien); vol. 47, 1916, p. xiv (Ningteh, Fukien).

Four specimens have been recently added to the national collection, two (Nos. 63199-200) from the southwestern part of the province of Hunan by Dr. Lewis R. Thompson, one (No. 64646) from Kuliang by C. R. Kellogg, and one (No. 65408) from Foochow, Fukien, by Mr. Sowerby. The number of black rings on body and tail is respectively 54, 47, 59, and 58, showing that the specimens are of the normal pattern of this form.

**DISTEIRA CYANOCINCTA** (Daudin)

For synonymy see Herpetology of Japan, 1907, p. 428, to which add:

*Distira cyanocincta* WALL, Mem. Asiat. Soc. Bengal, vol. 2, no. 8, 1909, p. 217.

*Disteira cyanocincta* STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 30 (Foochow, Fukien).

*Lioselasma cyanocincta* WALL, Snakes of Ceylon, 1921, p. 361.

A single specimen (No. 46521) from Shanghai has been presented by D. C. Jansen.

**Family CROTALIDAE**

**Genus AGKISTRODON Beauvois**

In the Herpetology of Japan (p. 450) I referred to the "small compact group consisting of the species *Agkistrodon halys*, *blomhoffi* and *himalayanus* occupying the vast territory from the Kas-pian Sea in the west to the Pacific Ocean in the east, and from Lake Baikal in the north to the Hamalayas in the south" as being "closely interrelated, in fact so nearly allied that their descent from a common ancestor can not have taken place at a very distant period." With regard to the nomenclatorial treatment of these

<sup>62</sup> Herpetology of Japan, p. 397.

snakes, particularly *A. halys* and *A. blomhoffi*, the latter being the only form occurring in the territory treated of, I expressly stated that "to what extent the turning up of the end of the snout may serve *in all instances* as a character to separate *A. halys* I can not say for lack of material, and for that reason I shall *at present* treat the latter as a good species."

The doubts as to the specific distinctness of these forms, first hesitatingly expressed by Guenther in 1896, have since been justified by the investigations of Bedriaga, 1912, and of Nikolski, 1916, who have had access to an unsurpassed material of Central and East Asiatic specimens.<sup>63</sup> Bedriaga,<sup>64</sup> particularly, demonstrated the intergradation between *A. halys* and *A. intermedius*, though as a binomialist he treats them nomenclaturally as species, but as I had already (1907) shown the intergradation between *A. intermedius* and *blomhoffi*, Nikolski who on the contrary is a thoroughgoing trinomialist, accepted the nomenclatorial consequences and enumerated the various forms, including a new one described by him, as *A. halys halys*, *A. halys caucasicus*, *A. halys intermedius*, *A. halys brevicaudus*, and *A. halys blomhoffi*.<sup>65</sup> Both Bedriaga and Nikolski tried to introduce new criteria for the discrimination of these forms, the former mentioning the width of the rostral at the apex, the latter the relative width of the anterior and posterior nasals, which, when other characters fail, may be of assistance in dubious cases. Bedriaga also described a new species from western China as *A. strauchi* and essayed the following key (pp. 732-733):

- a*<sup>1</sup>. Large posterior supralabials; height of fifth supralabial equals length of free edge of third supralabial; rostral somewhat turned over above; canthus rostralis not marked..... *A. strauchi*.
- a*<sup>2</sup>. Small or medium posterior supralabials; height of fifth supralabial less than the length of the free edge of third supralabial; rostral not turned over onto the upper surface of head; canthus rostralis distinctly or sharply prominent.
- b*<sup>1</sup>. Width of upper, strongly narrowed part of rostral, measured at the level of the suture between internasals and nasals, equals half the length of suture between anterior nasal and rostral..... *A. halys*.

<sup>63</sup> Nikolski, for instance, had 173 specimens of *A. intermedius* and 48 of *A. halys*.

<sup>64</sup> Wiss. Res. Przewalski Central-Asien Reis., Zool., vol. 3, sect. 1, pt. 4, 1912, pp. 719-726.

<sup>65</sup> During the same year, 1916, Dr. J. C. Thompson (Trans. San Diego Soc. Nat. Hist., vol. 2, no. 2, 1916, pp. 61-76) attempted by the statistical method to reduce these various forms to synonyms of *A. halys*, but by bunching his figures under such geographic headings as Korea, China, mainland specimens, and island specimens, etc., without giving detailed data by individuals, he failed to bring out the significant facts associated with the geographical distribution of the variations observed by him.

*b*<sup>2</sup>. Width of upper, narrow part of rostral, measured at the level of the suture between internasals and nasals, greater than half the length of suture between anterior nasal and rostral.

*c*<sup>1</sup>. Distance from lower end of suture between upper loreal and upper preocular to point of lower preocular wedged in between second and third supralabials equals height of third supralabial; width of rostral at the level of the suture between first supralabial and anterior nasal as great as or somewhat greater than the distance from eye to nostril-----*A. blomhoffii*.

*c*<sup>2</sup>. Distance from lower end of suture between upper loreal and upper preocular to point of lower preocular, wedged in between second and third supralabials, distinctly less than height of third supralabials; width of rostrals, at level of suture between first supralabial and anterior nasal, less than distance from eye to nostril-----*A. intermedius*.

Nikolski, omitting *A. strauchi* as not being included in the Russian fauna, amended the key given in the Herpetology of Japan, in the following manner (p. 267, misprints corrected) :

*a*<sup>1</sup>. Ventrals 151, or more.

*b*<sup>1</sup>. Scales in 23–25 rows; anterior nasal somewhat larger than posterior.

*c*<sup>2</sup>. Subralabials 7-----*A. halys caucasicus*.

*c*<sup>1</sup>. Supralabials 8, rarely 7-----*A. halys halys*.

*b*<sup>2</sup>. Scales in 21–23 rows; anterior nasal at least twice as large as posterior-----*A. halys intermedius*.

*a*<sup>2</sup>. Ventrals 151, or less.

*b*<sup>1</sup>. Subcaudals 44 or more-----*A. halys blomhoffii*.

*b*<sup>2</sup>. Subcaudals 46 or less-----*A. halys brevicaudus*.

If the specimens, the unquestioned and detailed data of which have been recorded, were plotted on a map of Asia, it would be found that the individuals identified according to the above keys group themselves geographically in such a manner as to justify their recognition nomenclaturally. The number of specimens which deviate from the normal of each region is not greater than in most other cases of intergrading variable superspecies of wide distribution.

#### AGKISTRODON HALYS INTERMEDIUS (Strauch)

*Agkistrodon blomhoffii intermedius* STEJNEGER, Herp. Japan, Bull. U. S. Nat. Mus., No. 58, 1907, p. 464.—BARBOUR, Proc. New England Zoöl. Club, vol. 4, No. 1909, p. 73 (Mt. Taipaishiang, Shensi).

*Ancistrodon intermedius* SOWERBY in Clark and Sowerby, Through Shen-Kan, 1912, p. 110 (Shansi).—BEDRIAGA, Wiss. Res. Przewalski Central-Asien Reis., Zool., vol. 3, sect. 1, pt. 4, June 1912, p. 713, pl. 10, figs. 2–2a, 6–6b (Alashan; Ordos; Kansu).—TSCHUGUNOW, Ann. Mus. Zool. St. Pétersbourg, vol. 17, 1913, (p. 255) (Minussinsk).

*Ancistrodon halys intermedius* NIKOLSKI, Fauna Rossij, Rept., vol. 2, 1916, p. 276 (Mongolia, Gobi, Ussuri etc.).

The records published and specimens received since the publication of the Herpetology of Japan bear out the general statement made there regarding this form. Thus Bedriaga records 14 specimens from Alashan, Ordos, and Kansu with ventrals between 152 and 180; Tschugunow mentions 6 specimens from Minusinsk with ventrals between 158 and 174 (average 164); Barbour reports two specimens from Shensi having 157 and 161 ventrals. Sowerby sent a typical specimen (No. 49640), with scale formula : 23 sc.; 147 v.; 45 subc.; 7/8 lab., collected on September 29, 1911 at a locality 15 miles west of Tai-yuan-fu, Shansi, altitude about 5,000 feet, and one (No. 53365) from I-mien-po, North Kirin, Manchuria, with a scale formula of 21 sc.; 152 v.; 48 subc.; and 7 lab.

#### AGKISTRODON HALYS BREVICAUDUS (Stejneger)

*Agkistrodon blomhoffii brevicaudus* STEJNEGER, Herp. Japan, Bull. U. S. Nat. Mus., No. 58, 1907, p. 463.—BARBOUR, Mem. Mus. Comp. Zoöl., vol. 40, no. 4, Aug. 1912, p. 132, (Ichang and Kweichowhsien, Hupeh).

*Halys blomhoffii* GUENTHER in Pratt's To Snows of Tibet, 1892, p. 242 (near Kiukiang).

*Ancistrodon blomhoffii* STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 31 (Shanghai; Soochow, Hankchow, Wusich, Chinkiang and Tatung in Anhui).

*Agkistrodon blomhoffii brevicaudatus* BARBOUR, Mem. Mus. Comp. Zoöl.) vol. 40, no. 4, Aug. 1912, pl. 2, fig. 2 (emendation).

*Ancistrodon blomhoffii brevicaudus* NIKOLSKI, Ann. Zool. Mus. St. Pétersbourg, vol. 19, 1914 (p. 90) (Ussuri).

*Ancistrodon halys brevicaudus* NIKOLSKI, Fauna Rossij, Rept., vol. 2, 1916, p. 283 (Hongkong; Korea).

A considerable material has accumulated since the publication of the Herpetology of Japan, which throws further light on the vexing question of the distinctness of *A. brevicaudus*, *A. intermedius* and *A. blomhoffii*. The specimens collected by Sowerby in northern China are of special interest, particularly a series of 10 specimens from the Hsin-Lung-Shan district, Imperial Hunting Grounds, Chilili. They all have 21 scale rows, 136–144 ventrals (average 140), 35–40 subcaudals (average 39) and 7 labials, and are consequently all well within the limits set for *A. brevicaudus*, less than 151 ventrals and less than 46 subcaudals. Specimens from further south in eastern China, as the two by L. I. Moffett from Kiangyin, province of Kiangsu, and the one by C. H. Barlow from Wan Wang Shan, Chekiang, which have 21 scale rows, 7 labials, ventrals 136–140 and subcaudals 37–41, are of course equally typical. So are Barbour's Hu-

peh specimens: 21 sec.; 141–145 v.; 35–39 subc.; 7 lab. It is along the northern boundary between *A. brevicaudus* and *A. intermedius* that we expect and, indeed, find intermediate specimens. Thus Mr. Sowerby collected two specimens (Nos. 52339 and 52341) in southern Manchuria on the Yalu river, the boundary against Korea, about 180 miles from its mouth. Both have 21 scale rows and 7 labials, negative characters but in case of doubt pointing towards *A. brevicaudus* rather than *A. intermedius*; one has 143 ventrals and 41 subcaudals, well within the limits of *A. brevicaudus*. But the other one, which it would be absurd to refer to under a different sub-specific name, has 151 ventrals and 44 subcaudals. On page 452 of the Herpetology of Japan I said that "it would be impossible to say to which of the three forms (*brevicaudus* or the two forms of *intermedius*) a specimen with 151 ventrals and 45 subcaudals were to be referred unless it had 8 supralabials in which case it should probably be referred to *intermedius*. In the present instance, however, I have no hesitation in calling it *A. brevicaudus*, the decisive factor of course being the fact that its companion is typical of this form. Were it not for these dubious intermediate specimens in the geographically intermediate territory we would be justified in applying a binominal appellation rather than the present trinominal.

**AGKISTRODON STRAUCHI Bedriaga**

1912. *Ancistrodon strauchi* BEDRIAGA, Wiss. Res. Przewalski Central-Asien Reis., Zool., vol. 3, sect. 1, pt. 4, June 1912, p. 728, pl. 10, figs. 1–1d (type locality, Tungolo and Tatsienlu, Szechwan, China; cotypes, Petrograd Mus. Nos. 8533–8534; Potanin, collector).

1912. *Agkistrodon tibetanus* BARBOUR, Mem. Mus. Comp. Zoöl., vol. 40, No. 4, August, 1912, p. 133, pl. 2, figs. 3–4 (type locality, Ramala Pass beyond Tatsienlu, western Szechwan, 13,000 feet; type, Mus. Comp. Zoöl., no. 7327; W. R. Zappey, collector).

Of this recently described remarkable species, as yet very rare in collections, Mr. Graham has sent three fine specimens collected in July, 1923, at Ngan Yang, western Szechwan, at an altitude between 13,000 and 14,000 feet. This locality is evidently not far from the type localities of *A. strauchi* and *A. tibetanus*. Apparently the species is of very restricted distribution and is possibly limited to the high plateau of eastern Tibet above 13,000 feet altitude.

United States National Museum No.	Sex and age	Locality	When collected	By whom collected		
				Ven- trals	Sub- caudals	Labials
52339	Female, adolescent	Yalu River, South Manchuria		21	151	44
52341	Male, adolescent	do		21	143	41
52559	Male, adolescent	Kiangyin, Kiangsu		21	140	41
52560	Juvenile	do		21	138	40
60852	Male, adolescent	Imp. Hunting Ground, Chilli	Aug. 1917	21	140	41
60853	Female, adolescent	do	do	21	144	37
60854	Male, adolescent	do	do	21	142	36
60855	do	do	do	21	144	43
60856	Female, adolescent	do	do	21	140	36
60857	Male, foetus	do	do	21	137	44
60858	Female, foetus	do	do	21	139	36
60859	Male, foetus	do	do	21	140	41
60860	do	do	do	21	136	41
60861	Female, adolescent	do	do	21	136	35
64015	Juvenile	Wan Wang Shan, Chekiang	C. H. Barlow	21	136	37

*List of specimens of Agkistrodon strauchi*

Museum	No.	Sex and age	Locality	When collected	By whom collected	Scales	Ven- trals	Sub- caudals	Labials
United States National	66631	Female, adolescent	Ngan-Yang, Szechwan	July, 1923	D. C. Graham	21	160	38	7
Do	66632	Male, adolescent	do	do	do	21	152	37	7
Do	66633	do	do	do	do	23	152	43	7
Petrograd	8533	Adolescent	Tungolo	Potanin	21	149	44	7	6
Do	8534	do	Tatsienlu, Szechwan	do	21	161	44	6	7
Comp. Zoöl., Cambridge	7327	do	Ramala Pass, Szechwan	W. R. Zappey	21	152	43	7	

**AGKISTRODON ACUTUS (Guenther)**

For synonymy see Stejneger, Proc. U. S. Nat. Mus., vol. 38, 1910, p. 112, to which add:

*Ancistrodon acutus* BOULENGER, Proc. Zool. Soc. London, 1899, p. 166 (Kuatun, Fukien).—WALL, Proc. Zool. Soc. London, 1903, p. 98 (Yangtse Valley).—STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 31 (Fukien).

The National Museum is indebted to C. H. Barlow for a fine male (No. 64024) of this remarkable copperhead from Moh-Kan-Shan, Chekiang Province. The scale formula is as follows: sc. 21; v. 161; a. 1; subc. 65, of which the first eight are single, the others divided; l. 7; oc. 3-2; temp. 2+4; rostral undivided; lower postocular extending under the eye and meeting anteriorly a small subpreocular, thus separating the eye from the supralabials.

**TRIMERESURUS MUCROSQUAMATUS (Cantor)**

For synonymy see Herpetology of Japan, 1907, p. 467, to which add:

STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 31 (Fukien).

A young specimen (No. 63417) collected by Rev. D. C. Graham at Suifu, Szechwan, furnishes a welcome opportunity to examine into the identity of the Formosan representative of this poisonous snake and the mainland form. It will be recalled that the type of *T. mucrosquamatus* which came from Naga Hills, Assam, has been lost and that, as no specimens from that locality had been recorded since, doubt had been raised as to the title of the Formosan snakes to the name given by Cantor. Since then Mr. Stanley has recorded specimens from Fukien, but apparently no comparison has been instituted.

There can scarcely be any doubt that the Szechwan specimen is entitled to the name. On the other hand, it is a very young specimen, and the two Formosan specimens at my disposal are full grown. That may account for the different shape of the head which is much shorter in the Szechwan specimen. The only other difference of any consequence which I have found is that in the Szechwan specimen the number of scale rows between the subocular and the supralabials is four while in the Formosan ones there are only three and two. The very variation of this character in the island specimens, however, would seem to indicate that this difference is of no importance. The scale formula otherwise falls within the limit established for the Formosan specimens, viz., sc. 27; v. 205; subc. 77; l. 10. There are about 17 small scales in a row between the supraoculars, but Dr. Oshima,<sup>66</sup> has recorded 14 to 18 in Formosan examples.

<sup>66</sup> Annot. Zool. Japon., vol. 17, pt. 3, 1910, p. 206.

Since the above was set in type Mr. Graham has sent another specimen (No. 67778), also quite young, collected at Wanchan. It agrees with the one described above, but has only three rows of scales between subocular and supralabials, and about 13 between supraoculars. Sc. 25; v. 209; subc. 88.

#### TRIMERESURUS JERDONII Guenther

1875. *Trimeresurus jerdonii* GUENTHER, Proc. Zool. Soc. London, 1875, p. 233, pl. 34 (type locality, Khasi Hills, Assam; cotypes in Brit. Mus.; T. C. Jerdon, collector).—BOULENGER, Fauna Brit. India, Rept., 1890, p. 427 (Khasi Hills; Ichang, China).

*Lachesis jerdonii* BOULENGER, Cat. Snakes Brit. Mus., vol. 3, 1896, p. 551 (Assam; Kiatiangfu, Szechwan; Ichang).—WALL, Proc. Zool. Soc. London, 1903, p. 99.—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 367.

1889. *Trimeresurus xanthomelas* GUENTHER, Ann. Mag. Nat. Hist., ser. 6, vol. 4, Sept. 1889, p. 221 (type locality, Ichang, China; cotypes in Brit. Mus.; A. E. Pratt, collector); in Pratt's To Snows of Tibet, 1892, p. 241, pl. 1, fig. A (Ichang).

A splendid specimen (No. 64639) of this rare species was collected by Rev. D. C. Graham at Si-Gi-Pin, Mount Omei, Szechwan, on August 3, 1921. It agrees in coloration with Pratt's Ichang specimens as figured by Guenther. The scale formula is: sc. 21; v. 176; a. 1; subc. 42+. The large smooth temporal is a very striking character and serves at once to separate *T. jerdonii* from the other Chinese species. The species has no particular relationship with *T. mucrosquamatus* and *T. elegans* as surmised by me<sup>67</sup> at a time when it was unknown to me except from description.

#### TRIMERESURUS GRAMINEUS (Shaw)

For synonymy see Herpetology of Japan, 1907, p. 480, to which add:

STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 31 (Chekiang; Fukien; Hainan); vol. 46, 1915, p. xiii (Kuling Swatow), vol. 47, 1916, p. xiv (Hoihow; Foochow); vol. 48, 1917, p. xii.

Two rather young specimens (Nos. 64022–23) from Moh-Kan-Shan, Chekiang province) have been received from C. H. Barlow. They are in every way typical, green, with tail end more brownish, and a well-marked yellow lateral stripe.

<sup>67</sup> Herp. Japan, p. 468.

## Order TESTUDINATA

## Family PLATYSTERNIDAE

## Genus PLATYSTERNON Gray

1831. *Platysternon* GRAY, Proc. Zool. Soc. London, 1831, p. 106 (monotype *P. megacephalum* GRAY).

1848. *Platysternum* AGASSIZ, Nomencl. Zool. Index Univ., 1848, p. 856 (emendation).

## PLATYSTERNON MEGACEPHALUM Gray

1831. *Platysternon megacephalum* GRAY, Proc. Zool. Soc. London, 1831, p. 107 (type locality, China; type in Brit. Mus.; J. Reeves, collector); Ill. Indian Zool., vol. 1, 1834 (pl. 62); Cat. Shield Rept. Brit. Mus., vol. 1, March 8, 1856, p. 49 (China).—DUMÉRIL and BIBRON, Erpét. Gén., vol. 2, 1835, p. 344; Atlas, pl. 16, figs. 2-2a (China).

*Emys megacephala* TEMMINCK and SCHLEGEL, Fauna Japon., Rept., 1835, p. 49, (not of Holbrook).

*Platysternum megacephalum* GUENTHER, Rept. Brit. India, 1864, p. 43.—SWINHOE, Proc. Zool. Soc. London, 1870, p. 409 (Kwangtung and Kwangsi).—BOETTGER, Offenbach. Ver. Naturk., 24-25 Ber., 1885, p. 135 (South China); 26-28 Ber., 1888, (p. 107).—BOULENGER, Ann. Mag. Nat. Hist. (ser. 5), vol. 19, June, 1887, p. 461, pls. 16-17 (osteology) Cat. Chel. Brit. Mus., 1889, p. 46 (China; Siam; Pegu; Burma).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 359 (South China).—SIEBENROCK, Sitz. Ber. Akad. Wiss. Wien, Math. Nat. Kl., vol. 116, sect. 1, Dec. 1907, p. 1742 (Kwangsi and Kwangtung); Zool. Jahrb. Suppl., vol. 10, pt. 3, 1909, p. 450 (South China to Burma and Pegu).—STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 24 (Fukien); vol. 49, 1918, p. xiv (Foochow, Fukien).

1870. *Platysternon peguense* GRAY, Suppl. Cat. Shield Rept. Brit. Mus., vol. 1, p. 70 (type locality, Pegu; types in Brit. Mus.; W. Theobald, collector).

The first specimen (No. 66454) of this interesting snapping turtle ever received by the National Museum, was collected for it at Foochow, Fukien by A. de C. Sowerby. It corroborates the occurrence of this species so far north, as first recorded by Mr. Stanley.

## Family TESTUDINIDAE

## OCADIA SINENSIS Gray

For synonymy see Herpetology of Japan, 1907, p. 489, to which add:

*Ocadia sinensis* SIEBENROCK, Zool. Jahrb. Suppl., vol. 10, pt. 3, 1909, p. 470.

*Emys sinensis* STANLEY, Journ. N. China Asiat. Soc., vol. 45, 1914, p. 23 (Shanghai; Hangchow; Soochow; Fukien).

A characteristic specimen (No. 65427), a young recently hatched, was collected at Foochow, Fukien, by Sowerby.

## GEOCLEMYS REEVESII (Gray)

Herp. Japan, 1907, p. 497, pl. 30. Add to synonymy:

*Emys reevesii* STEINDACHNER, Reise Novara, Zool., vol. 1, Rept., 1867, p. 5 (Shanghai).

*Damonia reevesii* STEINDACHNER, in Wiss. Erg. Reise Szechenyi Ostasien, vol. 2, 1898, p. 505 (Pingleang-fu, Kansu).

*Geoclemys reevesii* SIEBENROCK, Sitz. Ber. Akad. Wiss. Wien, Math.-Nat. Kl., vol. 116, sect. 1, 1907, p. 1758 (Kwangsi and Kwangtung); Zool. Jahrb. Suppl., vol. 10, pt. 3, 1909, p. 477—STEJNEGER, Science (n. s.), vol. 27, 1908, p. 748.—BARBOUR, Mem. Mus. Comp. Zoöl., vol. 40, no. 4, 1912, p. 135 (Ichang).—NIKOLSKI, Fauna Rossij, Rept., vol. 1, 1915, p. 5 (Canton; Foochow; Shanghai; Chemulpo; Kioto).

*Damonia reevcsii* VOGT, Sitz. Ber. Ges. Naturf. Freunde, Berlin, 1914, p. 96 (Canton).—STANLEY, Journ. N. China Asiat. Soc., vol. 47, 1916, p. xiv (Lake Taihu, Kiangsu).—GEE, Journ. N. China Asiat. Soc., vol. 50, 1919, p. 184 (Soochow).

*Geoclemys reevesii unicolor* SIEBENROCK, Sitz. Ber. Akad. Wiss. Wien, Math.-Nat. Kl., vol. 116, sect. 1, 1907, p. 1759 (Kwangsi and Kwangtung); Zool. Jahrb. Suppl., vol. 10, pt. 3, 1909, p. 477.

*Damonia reevesi*, var. *unicolor* STANLEY, Journ. N. China Asiat. Soc., vol. 47, 1916, p. xiv (Lake Taihu, Kiangsu).—GEE, Journ. N. China Asiat. Soc., vol. 50, 1919, p. 184 (Lake Taihu).

The National Museum, besides the specimens enumerated in the Herpetology of Japan (p. 500), had already 5 good specimens (Nos. 46491–95) collected by P. L. Jouy at Hongkong and one (No. 31721) supposed to be from Shanghai by E. Deschamps. In addition, Mr. Sowerby has sent a young just hatched (No. 65426) from Foochow, Fukien, and a fine series of nine half-grown and adults (Nos. 65417–25) from Shanghai. These show the usual variations, and one (No. 65419) represents the melanistic phase nearly always found together with the normal form, a question which I have treated more fully in my article in "Science" quoted above. This specimen is uniformly black above, but the plastron is more or less dark walnut brown, lightest on the pectoral laminae near the median seam.

## CYCLEMYS TRIFASCIATA (Bell)

1825. *Sternothaerus trifasciatus* BELL, Zool. Journ., vol. 2, p. 305, pl. 14 [13] (type locality unknown; type in Bell's Mus.).

*Cistuda trifasciata* GRAY, Syn. Rept., 1831, p. 19 (loc. ?); Ill. Indian Zool., vol. 2, 1834 (pl. 61).

*Cuora trifasciata* GRAY, Cat. Shield Rept. Brit. Mus., vol. 1, March 8, 1856, p. 42 (China).—GUENTHER, Rept. Brit. India, 1864, p. 14 (China).

?*Pyxidemys trifasciata* FITZINGER, Sitz. Ber. Akad. Wiss. Wien, Math.-Nat. Kl., vol. 42, 1861, p. 411 (Shanghai).

*Terrapene trifasciata* STRAUCH, Mém. Acad. Sci. St. Pétersbourg, ser. 7, vol. 5, no. 7, 1862, p. 27 (East Indies).—BOETTGER, Offenbach. Ver. Naturk., 24–25 Ber., 1885, p. 133 (Shanghai); 26–28 Ber., 1888, (p. 104).

*Cyclemys trifasciata* BOULENGER, Cat. Chel. Brit. Mus., 1889, p. 133 (South China).—WERNER, Abh. Bayer. Akad. Wiss., II Kl., vol. 22, pt. 2, 1903, p. 359 (Shanghai).—SIEBENROCK, Sitz. Ber. Akad. Wiss. Wien, Math.-Natur. Kl., vol. 116, sect. 1, 1907, p. 1763 (Kwangtung or Kwangsi); Zool. Jahrb. Suppl., vol. 10, pt. 3, 1909, p. 502 (Kwantung and Kwangsi; Batu Island).—BRUNER, Blätt. Aquar. Terr. Kunde, vol. 19, 1908 (p. 746, fig. 6).

*Emys trifasciata* STRAUCH, Mém, Acad. Sci. St. Pétersbourg, ser. 7, vol. 38, no. 2, 1890, p. 65 (Canton).

*Cyclemys trifasciata* VOGT, Sitz. Ber. Ges. Naturf. Freunde, Berlin, 1914, p. 96 (Canton).

Only one specimen (No. 36413) of this species has come to the National Museum. It was collected by P. L. Jouy, 1881, in "China."

It is highly desirable to obtain more material of this interesting species with definite localities so that its precise geographical distribution may be ascertained. The locality Shanghai based on Fitzinger's statement that the *Novara* Expedition brought it from there is not beyond suspicion, as Steindachner does not mention this species in his detailed account of the reptiles of that expedition.

### Family TRIONYCHIDAE

#### AMYDA SINENSIS (Wiegmann)

*Amyda sinensis* (WIEGMANN) Herp. Japan, 1907, p. 524.

The student of the Chinese (and Japanese) soft-shell turtles is confronted by an unusually complicated problem, which because of its peculiar circumstances may perhaps remain unsolved. In the rivers from Hongkong north to the Amur, and also in Formosa and Japan proper, there occurs one or more forms of the Genus *Amyda*, which by some writers have been treated as a single species while others have regarded them as a "formenkreiss" consisting of possibly as many as 5 differentiated subspecies to be treated nomenclaturally as binominals or trinominals according to the individual views. The difficulties are chiefly due to (1) lack of material; (2) great variability of these animals; (3) breaking down of the natural barriers.

*Lack of material.*—One can hardly expect to do justice to the problem without a complete series from each of the main drainage areas of China and the islands, to consist of well preserved suites showing both the different stages of growth, the sexual and the individual variation within the hatching stage, the adolescent stage and the fully adult. Needless to say, such material exists as yet nowhere. Few museums indeed can boast specimens from more than a few localities, and those mostly of indifferent preservation and uncomparable because of different age or sex.

*Variability.*—To illustrate this it is only necessary to recite the fact that Père Heude, who once attempted the study of these turtles, felt constrained to propose 8 specific names (each with a different generic name) for the form inhabiting the lower reaches of the Yangtsekiang.

*Breaking down of the natural barriers.*—Two factors are here of importance, human agency in carrying these valuable food animals from place to place in order to market them or transplant them; physical changes in the environment, some of which may be due directly to man's activity in building canals, thus opening up direct water communication between different river systems, or the rivers themselves changing their course. Thus the Hwangho in 1852 broke through in a northeasterly direction debouching into the Gulf of Chili instead of 4 degrees of latitude further south. We are informed that because these turtles are considered a delicacy and fetch higher prices in Japan, they are shipped in great quantities to the latter country and elsewhere, so that one can not be sure that the specimens obtained in a locality actually is a native of that place. The history of these animals goes back to the tertiary epoch, and we know now how different the drainage of those times may have been from that of the present time. While one might be tempted to approach the problem of these forms on the hypothesis that each of the great river systems, such as the Amur, the Hwangho, the Yangtsekiang and the West River might have favored the differentiation of its own peculiar form, experience from elsewhere shows that specific or even subspecific differences in these turtles may be older than the present river drainages. A glance at the map suggests that the great northern loop of the Hwangho, encircling Ordos and northern Shensi, may in part at least have belonged to an entirely different river system at some earlier period.

The Hwangho may therefore easily share two different forms of closely related turtles with other rivers, as does the Tennessee River, and the explanation may be similar.<sup>68</sup>

The material received by the National Museum, since the publication of the Herpetology of Japan, is not of sufficient quantity or quality to affect the preliminary views there expressed.

No specimens from the Amur river drainage representing *A. maackii* are in the museum, and none has been received since the publication of the Herpetology of Japan, which can be referred to *A. schlegelii*.

The specimens which have been added I am now listing under the name of *A. sinensis* with some doubt. Only one is supposed to be from near the type of locality (No. 46488) having apparently been

<sup>68</sup> See Stejneger, Proc. U. S. Nat. Mus., vol. 62, art. 6, Feb. 10, 1923, pp. 1-3.

acquired in 1883 at Hongkong by P. L. Jouy. It is in an indifferent state of preservation, and may have been purchased in the market. I am therefore unable to decide whether *A. sinensis*, from the West River drainage and *A. irrorata* from the Yangtsekiang drainage are identical or not.

Comparing the remainder of our Chinese mainland soft-shell turtles with the Japanese material at my command, as listed in the Herpetology of Japan, two conclusions force themselves upon me, namely, first, that the confidence I had in the table of measurements (p. 516) was to a great extent misplaced, owing partly to the scantiness of the material and partly to the selection of the length of the dermal carapace as the unit (100) for comparison. On the other hand, the additional material bears out the fact alluded to on page 517, that the plastron is shorter in the Japanese form. Reducing the length of the plastron to per cent of the width of the membranous shell, the Japanese specimens vary from 85 to 94, averaging about 90 per cent, while the continental and Formosan specimens vary from 92 to 101, averaging 97 per cent.

The overlapping is caused by two specimens (Nos. 39313-4) collected by Mr. Sowerby in the Hwangho near Honanfu, Honan, in which the plastron is as short as the longest of the Japanese, namely, 92 and 94 to 100 of body width. In other respects they also agree with Japanese specimens, but as they still fall within the range of the size of the plastron of the other continental specimens I prefer to name them *A. sinensis*.

Two other specimens (Nos. 39333-4) also male and female, were collected by Sowerby further north in the same river drainage, namely, respectively, 30 miles south and 12 miles east of Yenanfu, Shensi. They are considerably older than the Honan specimens and for that reason are not strictly comparable with them. They differ in several respects, notably in having a much greater interorbital width, but without corresponding specimens of the forms both to the north and to the south I hesitate to pronounce them different. The question of their relationship to *A. schlegelii* which according to Nikoloki is the form collected by Przhevalski in the Mongolian reaches of the Hwangho, is particularly interesting, but no solution of this vexed problem seems possible at the present time.

From Shanghai we have now one specimen (No. 46515) sent by D. C. Jansen, and two (Nos. 65415-6) by Mr. Sowerby, who also sent two females (Nos. 66455-6) from Hangchow, Chekiang. From Professor Ping a specimen (No. 66854) was recently received from Nanking. The above are all probably 3 to 4 years old, except the ones from Honan which are older.

A hatchling (No. 65428) collected by Sowerby at Foochow, Fukien, upon comparison with specimens from Japan of exactly same age

and size differs in having the carapace wider and the tubercles on the dorsal ridges much more pronounced. The dark pattern on the plastron in the Fukien specimen differs somewhat from that of the Japanese<sup>69</sup>; the line between the epiplastron is absent; instead of the heart-shaped spot on the median line between the xiphiplastra, there are two spots well separated one on each side of the median line, the two spots on the soft skin in front of the vent are unusually large, as are also the spots on the bridge filling the entire triangular space between the outer branches of the hyo and hypoplastra.

There are several more species of soft-shell turtles occurring in southern China. These as well as good series of the common species from all the great river systems would be very welcome additions to the national collection.

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<sup>69</sup> Herp. Japan, pl. 35.



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